The Builder.

SATURDAY, DECEMBER 24, 1853.

WE never seek occasion to find fault with the proceedings of authorized bodies, and are usually content to let the various institutions of the metropolis pursue their own objects their own way, satisfied that they are conducted by conscientious and able men, anxious to act rightly, and who are sometimes compelled to regard circumstances which are not known out of doors. Where, however, important interests are concerned, and truth would seem to be in peril, we should ill discharge our duty to the public if we did not put aside personal considerations, and point out what we consider the evil. Silence in such a case becomes complicity; and we must, therefore, at the risk of again incurring the rebuke of the council of the *Institution of Civil Engineers*, once more object to their practice of sending out an "authorized account" of the discussions which occur at the meetings of the Institution, and forbidding any person, on pain of excommunication literally, to make public any other particulars. It was a discussion on the drainage question that led us to object to this regulation before,* and it is a second discussion on the same subject which affords an instance of the evil attending it.

On the 13th instant, Mr. Harrison's paper on the Drainage of the District South of the Thames, noticed in our last (p. 763) was discussed, and the "authorized account" of the discussion,—after stating that the system of sewerage introduced at Hamburg by Mr. Lindley was alluded to, as a good instance of the efficiency of the plan of flushing sewers, even in very flat districts, and with syphon dips, when there existed a head of water like that from the Alster lake, which was 13 feet above the high-water mark of the Elbe, and that the system of flushing sewers was urged to be preferable to the labour and expense of pumping up from depths below low-water mark, the ordinary sewage contents, without dealing with the rain-water falling during thunderstorms, which, it was contended, could not be raised by any amount of steam-power which could be practically adopted,—proceeds thus:—

"The best systems [of drainage] proposed were stated to be, the interception of the high-land waters, the carrying away by gravitation all the contents of the sewers which could be discharged into a low point of the Thames by natural means, and resorting to pumping only for such portions of the metropolis as were too low for any other system. Such, it was contended, was the plan which had been proposed by Mr. J. R. M'Clean to the Commissioners of Sewers, in 1849; and in a review of the systems proposed by Captain Vetch, the late Mr. Foster, and Mr. Bazalgette, the accordance with and deviations from the original plan were pointed out and commented on.

The necessity for providing against any chance of flooding the basements of the houses, by allowing the main sewers to become filled and be under pressure, was insisted on. Doubts were expressed as to the possibility of obtaining sufficient velocity to scour out such main sewers as those proposed to be flushed from the Thames, and having their outlet at Greenwich.

The question of pipe drains and brick sewers was again entered upon, and it appeared, that experience *confirmed* the previous impressions of the applicability of the pipes to house drainage *only*, when they had rapid fall and were of sufficient area, but that *nothing could be relied upon for street sewers, except brick constructions, sufficiently large to permit access within them*: they should also be permeable, so as to act as drains in conveying away the land water from the district which they traversed. It was stated, that in Lambeth there were spots which about twenty-five years since were full of water, but which at present, during the summer, were found to have been thoroughly dried by the action of the sewers passing through or near them.

It was urged, that the question of the proper outlet for the sewerage could only be fixed by careful investigation of the period during which the matter remained suspended, and the distances it travelled up and down the river with the ebbing and flowing tides. The experiments already made on this point did not appear to be received as authority.

In treating the questions of detail, it was *shown* that the *brick sewers never, practically, became elongated cesspools*, as had been asserted; that there was really greater scouring power in an egg-shaped sewer, than in a pipe drain; that the alleged smooth interior of the pipes was illusory, as their joints were more liable to occasion stoppages, than the joints of the brick-work; that the interior of the latter did, practically, soon become covered with a slimy matter, which aided the flow; and that deposits rarely occurred, except where the sewers were too flat and too small.

As to the qustion of cost, it was shown, that the statements of the comparative expense of the metropolitan and of the country drainage works, as published "by authority," must be received with caution: the cases were not analagous, from the impossibility of comparing the ducts made to convey sewage one quarter of a mile, with those intended to convey the cumulative proceeds of many miles of dwellings. The mere difference of the cost of labour, between London and the country, would preclude comparison as to the expense of works; and the local difficulties of cutting under ground in large cities, must be taken into consideration."

Now, we would ask, are the public to understand that the Institution of Civil Engineers asserted at that meeting, without a dissentient voice, that experience has proved that pipes are applicable only to house drainage, and to these only provided they have "a rapid fall, and are of sufficient area;" that nothing can be relied on for street sewers except brick constructions, large enough for men to go up them; and further, that brick sewers never practically become elongated cesspools,—in fact, that deposits rarely occur in them? If there were dissentients, who were they? Even if a minority, their opinion might outweigh that of the majority.

As respects the propositions themselves, we are forced, without being partizans, to deny that experience has yet proved the truth of one of them: indeed, we ought to go farther, and say, that present experience disproves the whole. Rugby, Tottenham, Barnard Castle, St. Thomas's Exeter, Ottery St. Mary, and several other towns, to say nothing of two or three estates in the metropolis under our own eye, wherein pipe sewers are working efficiently, will serve for evidence so far as the first two are concerned; and he would surely be a bold man who would attempt to maintain the third, in the face of the numberless published diagrams showing the condition of the old brick sewers in London. If in the towns we have named, and in the great majority of cases in the metropolis, where, according to the Board of Health's reports, 250 miles of pipe sewers have been laid, these pipe sewers act perfectly well, it must be evident that the defects which have been discovered in special cases are not essential parts of the system; and bearing in mind the advantages of the system in other respects, it should be the duty of science to devise means for the prevention of what would seem to be simply abuses.

The report made by Dr. Arnott and Mr. Page on the causes of the late epidemic at Croydon, has of course been referred to with an air of triumph by the opponents of pipe sewers. Carefully examined, however, it will not be found to be worth much to them. As Mr. Austin remarks, in reply to Mr. Page's allegations:—"If the pipes are really found to be successful, an economical, self-acting, graduated system of drainage, of sizes proportionate to the flow of liquid refuse to be carried off, will be available for every district and class of town throughout the kingdom; but if the old plan must be perpetuated, the cost of construction must, as has been already stated, tend to confine any complete system of drainage to the more important towns and districts, and to involve even these in a very oppressive outlay. On the one hand, there is evidence of many failures of pipe drains; but it must be repeated, that in every case in which full inquiry has been fairly instituted into the causes of these failures, they are found, as in the Croydon case, to have been of a preventible nature. With regard, however, to many of these failures, no evidence whatever is adduced as to the completeness of the work, the sufficiency of water supply, or other circumstances which may have led to the result; yet we are asked to condemn and abandon a most valuable improvement, from the simple fact, that in certain cases it has failed, under whatsoever conditions. On the other hand, there is triumphant proof of the most complete success of pipe drainage completely and systematically carried out in several towns, a success equal to the most sanguine expectations that can possibly have been formed."

There were errors in the works at Croydon: some of the pipes were bad, and they were in parts improperly laid, but failures through these causes are not necessarily to be attributed to the system. The evidence the reporters took was insufficient as a basis of judgment. Their examination *in court* was only of forty-one persons, of whom five were residents at Beddington, and four others were the president of local Board, the engineer of the works, and two contractors for laying drains, leaving only thirty-two impartial Croydon residents. Their house-to-house inquiry, though returned as at ninety-two, was only at seventy-three houses, of which only sixty (stated erroneously as eighty-two), were connected with tubular drains. Thus altogether only 114 cases were investigated out of 2,000 (the number of houses drained on the new principle). In a very minute examination of the facts set forth in the report, with which we have been favoured by Mr. F. O. Ward, the writer shows that the house-to-house inquiry only brought to notice twenty-one deaths (not twenty-three as stated in the abstract, p. 65): of these twenty-one, twelve, on a close scrutiny, turn out to be due to causes utterly unconnected with the epidemic. Thus one was caused by bronchitis; one by water on the brain; one (a child) by teething; three (children) by ordinary scarlet fever; one by typhus a year ago (being before the outbreak of the epidemic); one by an illness which began one or two years ago; one by an illness which began before removing from Hampshire to Croydon; one (an old lady), by decay following very bad health previous to coming to Croydon; one (an old man) by an old complaint unconnected with fever, the termination of which had been long expected.

These twelve irrelevant deaths being struck off leave only nine deaths by epidemic, which being traced, are found to have occurred in nine houses, of which seven are reported by the owners to have been drained perfectly well, without a single stoppage, or stench, or inconvenience of any kind, by tubular drains; while, of the other two, one had a cesspool and common open privy behind the house, and the other is the subject of evidence which is at variance with the reporter's entry, the witness (Mr. Gray) saying, "No account of smells at Mr. Aris's, where my nephew died—no inconvenience from the drains. I do not believe his fever was superinduced by the drains at all."

Pushing this sort of scrutiny further, it ap-

* See vol x. pp. 767 and 793.

pears with respect to the seventy-three houses visited in the house-to-house inquiry of the reporters at Croydon, as follows:—

1. Of the houses in which *sickness had occurred*, 87½ per cent. were *not* connected with the new tubular drainage.

2. Of the houses in which no sickness had occurred, 86 per cent. *were* connected with the new tubular drainage.

3. Of the twenty cases of stoppage of drains met with in the house-to-house inquiry,—Three (or over 14 per cent.) were in *old barrel drains*, having nothing to do with the tubular system, against which they are made to tell by insertion in the report. Of the remaining seventeen houses, six (or more than 35 per cent.) must be struck off as cases of stoppage due (*by the witness's own confession*) to "stones," or "bad matter, improperly thrown into the pipes," or "negligence of persons using the water-closet." Two more (nearly 12 per cent.) return "stopped only at first starting, not since," showing these to have been due to early mismanagement, corrected by a few weeks' experience. Two more (nearly 12 per cent.) had had *no stoppages* up to the period of the great rains, which, coming unexpectedly before the completion of the system, water-logged the outfalls—an accident certain never to recur when the subsoil drainage is complete, and wholly beside the question of the tubular *principle*. Of the five remaining,—Four return, "Remedied directly;" "Very slight;" "None of consequence;" "Ceased very shortly after spontaneously;" while *one only* of the whole number attributes the evil to "the usual sewage stopping the pipes."

These results obviously go to disconnect the Croydon epidemic from the tubular drain as cause and effect; and when it is considered that, owing to local errors of the drain contractors, a number of 4-inch drains were fitted with soil-pans, having 4-inch inlets (instead of 2½ inch), thus affording ingress to substances *as large as the drains*—substances which it is a first principle of tubular drainage to *exclude* by reducing the size of the inlets *below* the diameter of the drains,—it will be seen that the general success of the Croydon drainage is an *à fortiori* proof of the soundness of the tubular principle, the wonder being that so very few accidents occurred with inlets made so much too large for the pipes to which they led.

This result is disguised in the report, and made to look like disastrous failure, by the evidence of each witness being broken up into seven parts, and scattered through seven lists, reference to which, for purposes of collation, is rendered almost hopeless by the transposition and frequent mis-spelling of the names (among which are found two Pages, two Wellers, a Combs and a Coombes, a Crickett and a Crockett, &c. &c.; in all, fourteen ambiguities of spelling, and above 200 transpositions in about 70 names), several *double entries* (No. 28, of list 1, entered at 37 and 52 of list 6. No. 26 and 27 of list 1 entered at 26 and 27, and at 44 and 45 of list 7). The result being that the fever list is swollen (for cursory readers) with the cases of "bronchitis," "water on the brain," "teething," "extreme old age," &c. &c.; while stoppages of *old* drains *cured* by the new plans, are made to figure as stoppages of tubular drains, and so forth. On the whole it appears,—

That the tubular drains there have worked well with some exceptions due to local and remediable causes (chiefly the neglect of the local builders, who broke the rules laid down).

That the bulk of the people of Croydon are satisfied with the tubular principle, though some have been annoyed by the remediable errors and mistakes.

That among the local and remediable mistakes were, the laying down of some pipe sewers a little too small, relatively to the house drains they had to receive, and somewhat too thin relatively to the weight of earth they had to bear; so that, in a certain number of instances, they were stopped or broken.

Efficient drainage is one of the greatest requirements of the day: on this hinges all real sanitary reform. Its cost is the great impediment; and whatever tends to lessen or increase this is therefore of the utmost consequence. We agree with Mr. Austin, "that the public requirements will demand for so important a branch of town improvements, upon which the health and comfort of the whole population so largely depend, that same consideration and that same adaptation of means to the end which have prevailed in other questions of engineering, and have alone led to the great works which are the honour of the country; in which the results of experience have been fairly weighed, and have been used to promote and amend, instead of to oppose and destroy, the attempts at improvement." Such general statements as those from the Institution of Civil Engineers, to which we are objecting, will not tend to the satisfactory solution of the question.

We do not meddle with politics, but we cannot close these observations without an expression of the deep regret with which we view the retirement of Lord Palmerston from the Home Office. His lordship, as we happen to know, was mastering all the details of the sanitary question, and would probably have effected an immense amount of good in that direction, if he had remained in power. We earnestly commend it to his successor as one of the greatest that can possibly occupy his attention.

WINDOWS FROM SYRACUSE, SICILY.

The modern town of Syracuse, which occupies but a very small portion of the site of the city of Dionysius, contains some very beautiful specimens of the works of our Norman forefathers.

One rich palace, called the Palazzo Buonadonna, might pass muster very easily for an English work of the thirteenth century. Three other Gothic palaces present some very novel and effective details. From these are taken the specimens engraved. The arrangement of the sill of one window and the arch of the other are worthy of remark. Alfred Bailey.

ON THE APPLICATION OF PAINTED GLASS TO BUILDINGS IN VARIOUS STYLES.*

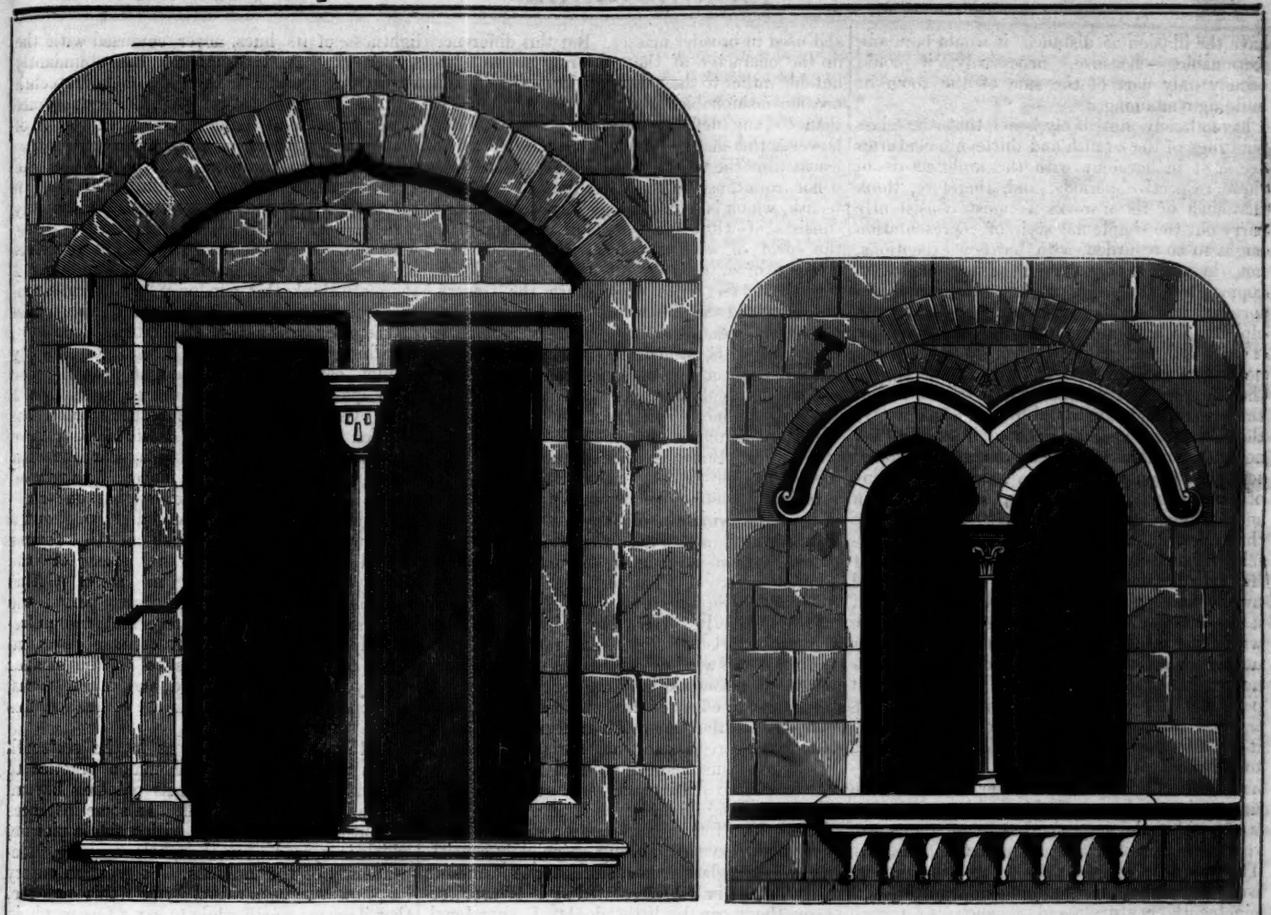
I am quite aware that the employment of rich and deep colouring in windows has a tendency to diminish the apparent size of a building, and I am ready to admit that it is to a fear of producing this result that we may attribute the modern practice of decorating the windows of a Greek building with glass too faint in its hues to rescue it from the imputation of washiness. But it is by no means necessary to go into the opposite extreme. A glass painting entirely composed of white glass would harmonize with the character of Greek architecture equally as one principally composed of coloured glass; provided that the white glass was, like that of the twelfth and thirteenth centuries, solid in appearance, and had a rich cool tone. And even when the employment of a larger proportion of coloured glass might be desirable, it would always be possible to make the window recede from the eye, by using in it a predominating quantity of blue and white. But whether the advocates for powerfully-coloured or for white windows, as being most in keeping with the character of a Greek building, are right, I trust that all will agree in preferring rich tints to poor ones. Had the ancient Greeks glazed their windows, we may be certain that they would have used glass of rich tint, whether it was white or whether it was coloured; for amongst all the ancient Greek glass vessels that I have examined, I have never met with any of a poor tint or flimsy appearance either in point of colour or texture of the glass. And, indeed, so closely does the glass composing these remains resemble in its appearance and chemical analysis the window-glass of the twelfth century (from which that of the thirteenth differs but little), that were I desirous of forming an idea of what Greek window-glass would have been like, I should endeavour to call to recollection the tints of Suger's glass at St. Denys, or that of the glass in the W. triplet of Chartres. And besides, the remains of strong colour used in the decoration of ancient Greek buildings, leads to the inference that the ancients, had they used window-glass at all, would have employed that possessing a rich tint, from choice as well as necessity. We are still less without authority to guide us in regard to the design for windows proper for ecclesiastical buildings in the Greek or Roman style of architecture. The views I have expressed with reference to the colouring of these windows, must confine me to an advocacy of a simple flat system of representation, because pictures composed on the principle of representing depth, cannot properly be executed in glass entirely consisting of strong rich tints. The only attempt I have hitherto seen at designing windows for a Greek building, is at the Church of St. Vincent de Paul at Paris. But however worthy of notice these windows may be as an embodiment of a new idea, they are neither sufficiently delicate in design, nor simple in execution, to serve as models for our imitation. It is very possible that this defectiveness may be in a great measure attributable to the thinness and watery character of the glass of which they are composed, and to the efforts of the artist to disguise the badness of the material by a more elaborate execution; but such expedients are no longer necessary, since, as I have before stated,* the manufacture of twelfth century glass has been revived; and which I have always considered the more fortunate, on account of the use that might be made of it in the embellishment of classical architecture, consistently with which, unlike the Gothic, art may be fully developed. There can be no doubt that valuable hints might be derived from an examination of the designs of ancient sculpture, and even of tessellated pavements. Indeed classical designs, admirably adapted for glass paintings, are engraved from sculpture in Pistolesi's "Vatican:" the most remarkable one is given in the 2nd vol. plate 3.† These designs consist of figures and ornaments in one plane, and therefore if executed in glass, as I have recommended, would a good deal resemble the works of the twelfth and thirteenth centuries. These mediæval works must appear to the most careless observer to be defective in many respects, particularly in relief. When viewed closely, the intention of the artist to bring out the various projections of the figure and drapery, by means of strong black lines, is often admirable, especially as seen in the heads of the figures; but, sometimes from want of boldness, sometimes from a want of knowledge where to place the shadow, Early English figures in glass, when viewed from a little distance, are too apt to appear like flat surfaces; quite as flat, if not more so, as the men and horses appear to be in those copies of the inner frieze of the Parthenon, which, placed in situations distant from the eye, and exposed to the influence of full light, are used to decorate the outsides of some of our public buildings. I am far from agreeing with those who contend that no greater relief ought to be imparted to a simple flat glass painting, than is given to those flat rilievi from the cella of the Parthenon; for those who urge such views seem to have entirely overlooked the original situation of these rilievi, placed where no direct light could reach them. To use the words of one of our most accomplished artists,—"It is a great mistake to suppose that the flat style of relief was intended to appear flat; and it is a great mistake to apply it in situations, as in the open air, where it must appear so, and be indistinct besides."‡ In accordance with this

* See p. 738, *ante*.

* See paper "On a revived Manufacture of Coloured Glass used in Ancient Windows," read at the Institute, and printed in our 10th volume, p. 402.

† "Il Vaticano descritto ed illustrato da Erasmo Pistolesi."—Roma, 1829; see also vol. 5, plate 81, and vol. 8, plate 4.

‡ "Contributions to the Literature of the Fine Arts," by Sir Charles Eastlake, Pres. R.A. p. 104.



WINDOWS FROM SYRACUSE.

authority, I will venture to say, that quite as much relief ought to be given to the figures in the simplest and flattest glass painting, as is given to the alti rilievi in the metopes of the Parthenon, which were intended to be seen in the open air, and from a distance. I throw out these observations, however, rather with reference to those who may be about to design simple flat glass paintings for mediæval buildings; for since I am perfectly sure that none but first-rate artists can design windows fit for classical buildings, I may well be content to leave the matter entirely in their hands; and can only express my surprise that a field so favourable to a display of the highest art, should have been so long neglected. Flaxman's labours sufficiently show the possibility of employing the exquisite language of the ancients to express true christian sentiment; and some of his choicest designs might advantageously be reproduced in painted windows for classical buildings, were it only by way of proving to the public what works of art painted windows might become in competent hands.

I shall trouble you with but few remarks on the selection of glass paintings for buildings in the Palladian style of architecture, in which I would include all Wren's churches, and even St. Paul's itself; for though that building has in parts a Roman severity, its interior in particular bears many marks of the taste of the seventeenth century, especially in the ornamental details. Such buildings, taken on the whole, are less severe in character than true Roman or Grecian buildings, and therefore would seem to require a corresponding relaxation in the character of their painted windows. In my opinion no greater mistake is committed than when a stiff Byzantine style of decoration is applied to the windows of a Palladian building. I have heard it defended on the ground, that since such glass would harmonize with the character of a Roman building, it ought equally to harmonize with the character of a Palladian one, because both styles of architecture have a common origin in the old Roman,—an argument which is at once disposed of by the remark, that the Romanesque style betrays its more immediate origin, in the Greek character of its ornaments and some of its mouldings, from which character the Palladian is free. I have also heard it defended on the supposed necessity of imparting a more religious air to a Palladian church. But surely there must be other and more legitimate ways of increasing the solemnity of a building than by the introduction of incongruous ornaments and decorations, which oppress the architecture by their severity. Who would think of encrusting the walls of St. Paul's Cathedral with stiff Byzantine mosaics? I believe that it is amongst the works of the cinque-cento periods that the true models for painted windows suitable for Palladian churches are to be sought. Amongst these works, as has been remarked, many varieties of design and character may be seen. Some are more solemn and grave than others; but the blended and comparatively undecided colouring of even the most simple, renders them less solemn and severe than the ordinary works of the twelfth and thirteenth centuries. In most matters of detail, also, cinque-cento glass paintings accord with Palladian architecture; so that, on the whole, the cinque-cento style of glass painting, as developed in its best specimens, seems more suited than any other known style for the windows of Palladian buildings.

In adopting this style, the glass-painter, as before stated, is by no means confined to the use of pictures having receding backgrounds, but may use as flat a composition as a line of well-relieved figures placed in front of a sheet of tapestry; or even, in small works, or in the accessory parts of greater works, would find authority for the employment of well-relieved figures on perfectly flat coloured grounds. The use of receding pictures in painted glass in any building, of any style, has, however, been strenuously objected to; and the present seems a good opportunity of inquiring a little into the validity of the objection.

It proceeds, as far as I can understand, on two grounds;—the first being the supposed unfitness of the material for any sort of representation more pictorial than the mosaics of the twelfth and thirteenth centuries; the second, the supposed impropriety of representing a receding picture on the wall of any building. In support of the first ground of objection, we are told that a glass painting reverses the conditions of nature, by making the lights transparent and the shadows opaque; that the violence of its colouring is wholly opposed to pictorial effect, and that to bound objects with black lines is reprehensible on every artistic consideration. The first of these arguments is at once disposed of by the observation, that we have nothing to do with anything but the *effect* of a glass painting; and that when the material is, like that of the cinque-cento period, of a horn-like texture, the high lights do *not* appear to be less solid than the shadows.

With regard to the two other objections, I admit that they should be unanswerable, if it was true that an artist was precluded from painting a picture under any other than the most favourable conditions. But to assert this would be to fly in the face of all authority,—and, what is worse, to contradict all experience. * * * The remaining objection, that it is wrong to represent a receding picture on the wall of a building, and consequently in a window, the glazed surface of which is but a continuance of that wall, seems to rest less on a consideration of facts, or the dictates of our external senses, than on a sort of mock philosophy, which seeks to escape laborious investigation by the enunciation of a "principle"—than which, by the way, nothing is more easy. It may be conceded that to carry a receding picture all round a room produces an ill effect. But pictures, though representing the effect of depth and distance even almost to illusion, are admitted to be allowable, provided they occupy only a portion of the wall, either by being hung against it in a frame, or by being actually painted upon it: the latter sort, indeed, can plead the testimony of ages in its favour. If, then, a glass painting should

have the illusion of distance, it would be unobjectionable, — because, necessarily, it could occupy only part of the side of the room or building containing it. * * *

I have already stated my belief that the glass paintings of the twelfth and thirteenth centuries are most in harmony with the architecture of these respective periods, and, therefore, think that such of those works as most consistently carry out the simple flat style of representation ought to be regarded, with but few exceptions, not, indeed, as objects to be reproduced in copies, but as guides to assist the artist in forming new and original designs. The principle of an ancient composition might be more strictly adhered to now than at any former period, on account of the revived manufacture of the window glass of the twelfth century; but this recommendation would by no means involve the necessity of copying the object itself. Indeed, nothing is more thoroughly opposed to sound sense and good taste than a mere servile copy of an ancient glass painting, or a copy with such trifling modifications as to be little else than a servile copy. If intended as a counterfeit, it must fail in its object; for none but the inexperienced are likely to be deceived by it, and once known to be a counterfeit, it would lose all interest from association with by-gone ages. If intended to pass for nothing more than a copy, under the *bonâ fide* impression, that nothing, except a copy of ancient painted glass, will harmonize with Gothic architecture, it serves but as a cover for indolence—it can advance nothing, because a copy is sure to fall short of the original in all real merit,—and, besides this, its production amounts to an unconscious satire on Gothic architecture, when we consider the imperfect state of the art of representation as displayed in ancient windows. The only true course is to treat every modern work in painted glass as an original work of the nineteenth century, and as such, to test it according to intelligible rules of taste. The inquiry ought no longer to be confined to the narrow issue of conformity with some ancient authority, but should extend to a consideration of its intrinsic merit as a work of art, and its extrinsic merit as being in harmony with the architecture with which it is associated. To prescribe so wide a field of inquiry might, indeed, prove inconvenient to certain critics, but would certainly tend to a more zealous investigation of the principles of ancient art than heretofore, and to the production of works more worthy of the nineteenth century: in short, it is by this means only that any progress can be made. A nineteenth century window, designed for a twelfth or thirteenth century building, ought not only to harmonize with the architecture in the quality and treatment of its colouring, but, besides restraining conventionality within due bounds, should likewise be free not merely from the bad drawing, but from the quaint and contorted attitudes of the figures of the twelfth and thirteenth centuries; attitudes which, however fashionable they might have been at that period, are shocking to our present tastes and feelings. It should, in fact, reproduce nothing but the art of that period, the genuineness of which will only appear the plainer, when the film of bad taste and deformity is stripped from it, through which which we are now obliged to penetrate before we can fairly see it. I should add, that in designing a window for a twelfth-century building, the artist can never do wrong in going at once to the fountain head, and correcting his taste by the remains of classical art, whose influence is so easily recognised in the glass paintings of the twelfth and thirteenth centuries.

A consideration of the colouring best suited for the windows of a fourteenth-century building presents an interesting subject of inquiry, but into which I cannot, for want of time, particularly enter. The glazing of the fourteenth century, until about the year 1380, in respect of the quality and disposition of its colouring, holds in general a sort of middle place between the rich mosaics of the thirteenth century and the paler picture glass paintings of the fifteenth century; its individual colours being as cool, and almost, if not quite, as powerful as those of the thirteenth century—but being intermixed with a much larger proportion of white glass, and used in broader masses. But this difference in the character of the colouring seems attributable rather to the nature of the designs which became fashionable in the fourteenth century, than to any definite abstract principle. But however this may be, there is one lesson to be learnt from the works of the fourteenth century, if not from those of the latter part of the thirteenth, which is—that the glazing which chiefly consists of white glass is more favourable to the effect of window tracery, than that which consists of a mass of intensely rich colours. For the latter tends to confuse the tracery, unless indeed the direction of the principal lines of the glass composition are strongly opposed to the lines of the stonework, in which case there is a sufficient contrast between the stone tracery and the deep coloured glass to render the former perfectly distinct. Thus the mullions and tracery come out strongly in some of the clerestory windows at Bourges, and in the windows of York Chapter-house, where the glazing is principally white, but are not so easily made out in the windows of the Sainte Chapelle at Paris, which are filled with richly-coloured glass. On the other hand, the mullions of the southern rose at Chartres, which is likewise filled with richly-coloured mosaics, show themselves distinctly. Here the principal lines of the stonework diverge, like rays, from the centre of the window, whilst the principal lines of the glass composition form concentric circles. The star-like effect of this, and many other rose windows of the thirteenth century (the north rose of Notre Dame, at Paris, is another example), thus being produced by the opposition of two distinct designs,—one of which, the stone design, appears as if it was laid upon the other. If this consideration should lead to the conclusion that glazing, principally consisting of white glass, is best suited for the windows of buildings in the Decorated style of architecture, there can be little doubt, I apprehend, that the best designs would be those consisting of pattern-work painted on white glass, of which there are numerous and beautiful examples in the cathedrals of York and Exeter, Merton Chapel, Oxford, and other places, with or without the enrichment of inserted panels, containing groups, or single figures, on stiff coloured grounds, executed in the simple flat style before mentioned. I would on no account advocate the use of figures and canopies, because the stiff character of the colouring, which does not materially differ from that of the thirteenth century, is unfavourable to such a display of light and shade as is necessary to make the canopies seem as if they projected forward. I have heard the flatness of decorated figures and canopies defended on the score of their resemblance to some of the published outlines of the German engraver, Retsch; but these outlines are only intended for near inspection, by which alone the varying thickness of the outline, which produces the effect of light and shade, can be appreciated. At a distance, these designs would, of course, be invisible; or if enlarged in painted glass, as I have also heard recommended, would appear flat and thin; just as a copy of a fourteenth century monumental brass would look if executed in painted glass.

The change in the nature of the material, in 1380 or thereabouts, and the substitution of glass, such as we see used in the works of the fifteenth and sixteenth centuries, for the deep intense tints previously employed, is, like many other points connected with the history of an art, one on which no light has hitherto been thrown. It is but a conjecture that the change was brought about by the glass-makers in Germany. But I think we may conclude, from the fact that glass painting was becoming more pictorial just before the change in the material, and that it became still more pictorial after it, that the lowering of the different tints in depth was intended to second the efforts of the artist to produce glass pictures in preference to glass mosaics. One is tempted to infer the existence of some harmony between the character of the architecture and the delicate tints and silvery tone of the glass of the fifteenth century, from their having been so long associated together. And, in one respect, the glass is no doubt well suited to the architecture. For even the most elaborately painted window is, owing to the lightness of its hues, never confused with the stonework. And experience has abundantly shown that the effective pictures of the sixteenth century harmonize as well with the architecture of the fifteenth as the imperfect productions of that period. There is no apparent difference between the architecture of the windows of Fairford Church, Gloucestershire, and that of the windows of churches quite half a century earlier: and yet the sixteenth-century glass, with which these windows are filled, is in perfect harmony with the character of the building. I therefore think that windows for fifteenth-century buildings should be designed on the model of the glass paintings of the sixteenth century; in which case the artist might consistently employ canopies, if he thought proper. The most splendid Gothic canopies in glass that I have ever seen are in two of the windows of Munich Cathedral; one is dated 1503. These canopies are so painted as to appear like what they profess to be,—hollow niches. As a general rule it appears more satisfactory that one scale of figures should be preserved throughout a window, than that the size of the figures should be regulated by the sizes of the lights they occupy, as in most Gothic examples. In the cinque-cento period the uniformity of scale was preserved, not unfrequently, by the employment of angel boys, instead of full-grown figures, to fill the smaller tracery lights. At Fairford, and other places, the expedient adopted is the use of demi-figures in the tracery lights.

In the fifteenth as well as in the sixteenth century, it was a not uncommon practice to extend the design of a glass painting beyond the limits of a single light. In some instances the entire window is filled with a single picture, which is spread over the whole opening, independently of the mullions. So great an outcry has, however, been raised against this practice, that it seems worth while to say a few words in justification of it. In the first place there is not, I conceive, a greater violation of principle committed, in laying as it were the design of Perpendicular tracery work over the design of a fifteenth-century picture in glass, than is committed in laying the design of a thirteenth-century rose window over the design of its glazing. The stonework of the window sustains no injury of effect: on the contrary, it is rendered more distinct by the opposition of its design to that of the glass. Neither is the glass painting injured by being cut by the stonework, for the force of imagination is such, that the design may be preserved in all its unity, through any number of lights; an observation which, I think, will be admitted to be true by those who have been in the habit of looking at such works with an unbiassed eye. But the practice may be defended on another, and perhaps less questionable, ground—on the score of necessity. Our ancestors were in the habit of representing in their windows vast numbers of legendary saints; but modern practice is in general so opposed to this, as in effect to limit the choice of the artist to representations of our Saviour, the four Evangelists, the twelve Apostles, occasionally the Virgin Mary, and some of the Prophets and Patriarchs. I believe that I am speaking within compass when I say that his choice does not extend beyond three dozen single figures. Consequently, monotony is inevitable, unless recourse is had to groups of figures. Here, indeed, the means of selection are almost unlimited. Flaxman declares (Works, p. 337), that it may be affirmed "without danger of exaggeration, that many hundred subjects are to be found in the sacred writings which, being ably designed, would be *new* to the beholder." But in order to ensure a sufficient scale for the figures, the group must not unfrequently be extended beyond the limits of a single light. Upon the ground of necessity, therefore, we may well justify the carrying a glass picture across a window, to a certain extent irrespective of the mullions. And I should perhaps add, that when we consider that painted windows by their size might not unfrequently offer a field for the talents of the historic painter, it seems unadvisable to scare artists from it, by imposing conditions which were often broken through by the mediæval painters themselves.

In conclusion, I will repeat what I stated at

the outset, that I claim no infallibility for any of the views I have advanced. I am conscious of having approached delicate ground more than once; especially in the course of my remarks on the sort of glass paintings best suited for buildings in the Classical styles. On this point I consider that I have but raised questions which wiser heads than mine must solve. My object will have been accomplished if I have added but one grain of information to the common stock: or if I have succeeded in proving that there is no mystery in glass painting; that it is a branch of the Fine Arts, distinguished from others only by certain conditions, and that the same sober rules of criticism equally apply to the productions of the glass painter. To take a familiar instance—we sometimes hear it disputed whether the flesh ought to be coloured or left white, in a glass painting; the opponents of tinted flesh urging the impossibility of imitating nature exactly in this respect. The answer is obvious enough. The whole colouring of a glass painting is highly conventional, whether it be of the draperies, of the flesh, of the sky, or of any other object; still so long as it does not exceed the limits of conventionality—a point to be ascertained only by observation and general opinion—the eye and imagination are satisfied. We should be startled and disgusted at seeing flesh painted green or blue, but the complacency with which pink or white flesh in a glass painting is regarded by the generality of mankind, is a sufficient proof that neither of those tints contradicts nature too violently; and therefore, that the artist does not exceed the limits of conventionality in using either white or tinted flesh, at his discretion. The wide range of this paper, and the necessity of confining its length within reasonable limits, have of course compelled me to touch on several topics in a very cursory manner; and especially that relating to the actual mode of executing a glass painting, on which the argument in favour of the mosaic system almost entirely depends. However, as I went into this subject at great length in a little work which I published in 1847,* I must refer those to it who are inclined to pursue the matter further. It may seem superfluous to those who have read this book, to assure you that there is a perfect consistency between it and such views as I have just expressed; but as certain writers are in the habit of taunting me with inconsistency, I may as well state that the only foundation for the charge is this—that perceiving at the time when that book was written, that modern copies of the thirteenth-century windows, besides being very raw in colour, were, owing to the extreme pellucidness of the glass then in use, thin and poor in effect, the most favourable examples never having a more imposing air than a *veneer* of an old window might be expected to have, and that the process of antiquating the glass, that is, dulling it over with enamel brown in imitation of the effect of age, only produced dulness without imparting depth—I ventured to suggest the adoption of shadows, such as we see in cinque-cento work, as well as a broader style of colouring than was used in the mosaics of the thirteenth century, as a means of correcting the flimsiness, without destroying the brilliancy of the material, and, at all events, of giving *power* to the work. And that since the manufacture of the twelfth century glass has been revived, I have advocated a nearer approach to ancient precedents, both in the execution of the painting and the method of its colouring. I trust this brief explanation will finally dispose of the charge to which I have alluded; a charge which never would have been made any more than the absurd misrepresentation, that I have at any time recommended the universal employment of the Cinque-cento style, details and all, had it not been for those writers' ignorance of the subject on which they professed to write, and their consequent inability to comprehend any argument in relation to it which is founded on general views.†

CHARLES WINSTON.

* "An Inquiry into the Difference of Style observable in ancient Glass Paintings, with Hints on Glass Painting, by an Amateur," p. 238, *et seq.*

† This paper was read at the Institute of British Architects, as previously noticed, and was discussed there on the 19th inst.

OUTRAGEOUS TAX ON FIRE POLICIES.

OF all misfortunes which impend over humanity, none are ordinarily more fatal than those occasioned by fires. The tenement, the furniture, the documentary titles, and even the lives of inmates, are oftentimes sacrificed; and yet there is no contingency of loss so easily guarded against. The system of insurance against fire is comparatively a modern institution, and was confined, until a very recent period (within the memory of man), to some dozen great offices. These offices increased, with the provident custom of insurance, to enormous establishments. They amassed colossal revenues, and charged premiums much higher than practised actuaries of our day find sufficient to realise a profit. The increasing demands of the community soon awakened competition, and companies became, in forty years, one hundredfold more numerous. So also rivalry abated the charge of security against loss by fire, until for 1s. 6d. per cent. *paid to the offices*, an occupier can secure his habitation and chattels against the accident so much to be dreaded.

The ravages of fire no longer make gaps in our streets, awaiting the revived energies and resources of the late tenant, whose whole worldly possessions have perhaps been a holocaust to the fatality. Insurance offices, even at the very scant premium of 1s. 6d. in the 100*l.* sterling, not only restore, but renew the burnt pile. But notwithstanding the manifest advantage and crying necessity for protection against the evils which await alike upon the cottage and the palace, *not one-half of the houses of Great Britain are insured at all.*

Considering the benefits derived from this system, and the prompt restitution and redress afforded by all insurance companies in cases of fire, this fact is astounding as it is alarming; and as there is no principle of provident forethought which ought to be more encouraged, so the Government should foster the tendency, and rather give a premium to the practice than impose an excessive impost upon it. Instead of this, however, the tax levied on fire insurance policies is just 200 per cent. or 3s. in the 100*l.*! just double the charge of the office which guarantees the risk!

The *impolicy* of this fiscal impost is so manifest, that it needs no remark, further than this, that but for that inordinate and extortionate levy, nearly every mansion and cottage in the kingdom would be guarded against the dread visitation.

A million a year is doubtless an item not to be lightly given up by a Chancellor of the Exchequer, but is there no national loss in the destitution annually caused by the destruction of uninsured property?

To tax provident precaution is to tax virtue; but to exact so inordinate an amount as double the charge made by officers for the absolute risks is a cruelty and a crime.

Seeing that the abatement of an extravagant impost is invariably followed by an increased revenue on that item,—it would be wise as well as beneficent for the Legislature at once to reduce the duty on policies by at least one-half, if not two-thirds: the increased numbers, if not entirely remunerative the first year, would soon make up the deficiency, and the extensive national advantages resulting from a generalized system of security would more than repay the loss to the exchequer.

If there are in Great Britain 500,000 houses uninsured the abatement of the present duties and premium from 3s. to 1s. per cent. would soon enrol on the lists of these provident establishments a number that might compensate the Government exaction, and this would be only a reduction by the Government to 1s. 3d. under the charge made by the officers.

The subject has been often considered by parliamentary men; still no great effort has ever been made to give free scope to the spirit of precaution which, under an altered system, would stimulate *every householder* to guard his hearth, his home, and his effects.

Risks on maritime insurances are also greatly aggravated by a heavy impost, and ours is the only nation that taxes trade (otherwise much emancipated), in excess.

The French call their ships buildings, or "bâtiments," and they are truly buildings in which are stored the prosperity and grandeur of every commercial country. To diminish the restraints on commercial navigation, is to spread 1,000 sails—to abate the iniquitous tax on house insurance, is to bring security to countless homes.

As a tax on commercial enterprise, the duty on fire insurance is the heaviest that ever was imposed. It distances even the Indian impost on salt.

Presuming that fire-offices realize, after deducting their losses and working expenses, one-fourth, or 25 per cent. on the premiums paid—and that is far beyond their actual profit—then the Government receives eleven times the whole trading profit! not leaving A TITHE to so hallowed an institution. What say ye to that, ye objecters to property tax?—double the whole trading capital, and eleven times the whole profits!

The trading companies run all the risk of loss by fire—the Government only the risk of being considered extortionate and reckless of the commonweal.

QUONDAM.

DICTIONARY OF ARCHITECTURE.

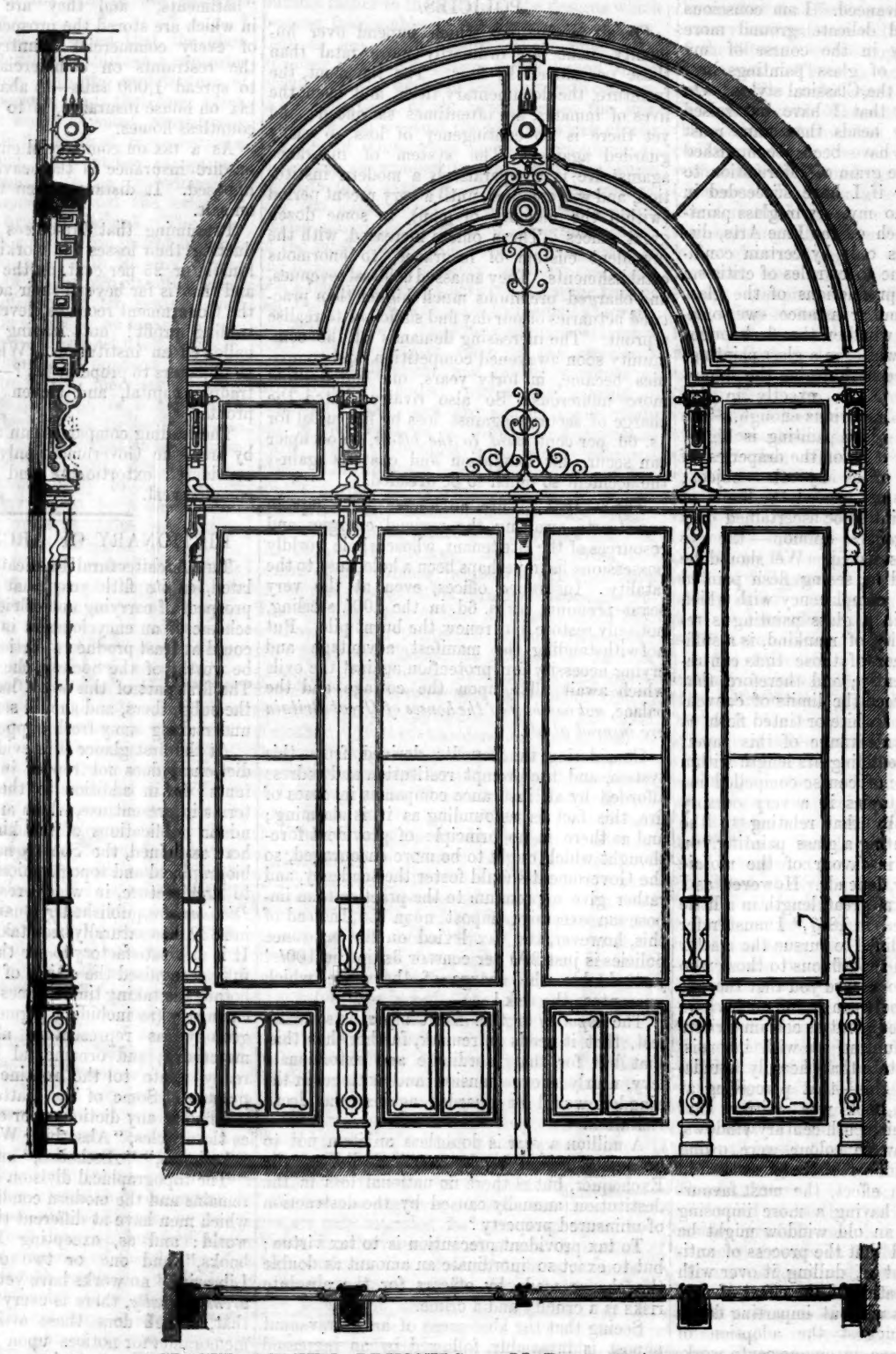
THE Architectural Publication Society calculated, in its fifth year, that if it had no fair prospect of carrying out efficiently its cherished scheme of an encyclopædia in many volumes, it could at least produce a dictionary which should be worthy of the Society, the age, and the art. The first part of this work has been issued to the subscribers, and should serve to gain for the undertaking many fresh supporters.

At the first glance it is evident that the term dictionary does not render justice to the contents; for in addition to the merely technical terms in present use, which are the stock of all minor publications of the kind, and which are here explained, the Society has undertaken the biographical and topographical subjects relating to architecture, in which respect the valuable *Dictionnaire*, published by Quatremère de Quincy, in 1832, has naturally been taken as the example. It is also satisfactory to see that the Society has fully recognised the claims of those subjects in botany (as taking timber-trees for its province); chemistry (as including pigments and metals); geology (as representing all other building materials); and ornamental decoration, which really relate to the routine of architectural practice. Some of the matter the reader will not find in any dictionary or encyclopædia, such as the articles, "Absorbing Well," "Acanthus," "Actinism," "Æsthetics," and "Alabaster."

The topographical division takes the ancient remains and the modern condition of the cities which men have at different times erected in the world: and as, excepting Murray's "Handbooks," and one or two other "Travellers' Libraries," no works have yet treated of towns *architecturally*, there is every reason to suppose that, if well done, these articles will serve as memoranda for notices upon the spot, and for saving a great deal of time when the voyagers would otherwise be ignorant that some predecessor had appeared in the expensive glories of line engraving, lithography, and type.

It is a feature of our new dictionaries that authorities are quoted, and their particular works mentioned: it is well to have the actual chapter and verse, unless every passage is identified or verified by the committee. It is needless to say that the titles and general character of a large number of very valuable works, unknown we fear to the majority of the architectural public, are thus brought forward, and form an important element of the new undertaking.

The society, but especially the committee, having begun this work, are seriously compromised: the profession will be really disgraced if they fail to carry it out as well as they have begun: they will have the dishonour of having prevented the appearance, we are told, of at least two other private undertakings of the same character; and they will have destroyed for a long time the chance of future co-operation to such an end. The book should be in the library of every architect, engineer, builder, and amateur; and we shall hope to see in the next report of the Society an accession of members sufficient to place all the



GLAZED SCREEN, BRUSSELS.—M. Beyaert, Architect.

responsibility of success upon the committee, who of course can only expend the amount subscribed—*the greater the number of subscribers, the sooner the undertaking should be completed.* Surely there must be at least a thousand to aid in such an event. Pray, come forward, gentlemen!

A GLAZED SCREEN, BRUSSELS.

The annexed elevation of a glazed screen and door, placed behind the *porte cochère* of a house in Brussels, we have engraved from the *Journal Belge de l'Architecture*. The height to the underside of transom is 2·90 metres, the total height 5·07 metres. The width is 3·08 metres. M. H. Beyaert was the architect.

A Bristol Archæological Society, we hear, will shortly be inaugurated under favourable auspices.

THE DUBLIN INDUSTRIAL IMPROVEMENT SOCIETY.

Many of the houses in which the labouring classes of Dublin are congregated are ill constructed, erected solely for the purpose of deriving a profit, and wholly irrespective of the comforts or necessities of the inmates. Cleanliness is impossible, and the consequent wretchedness of condition leads to abasement and crime.

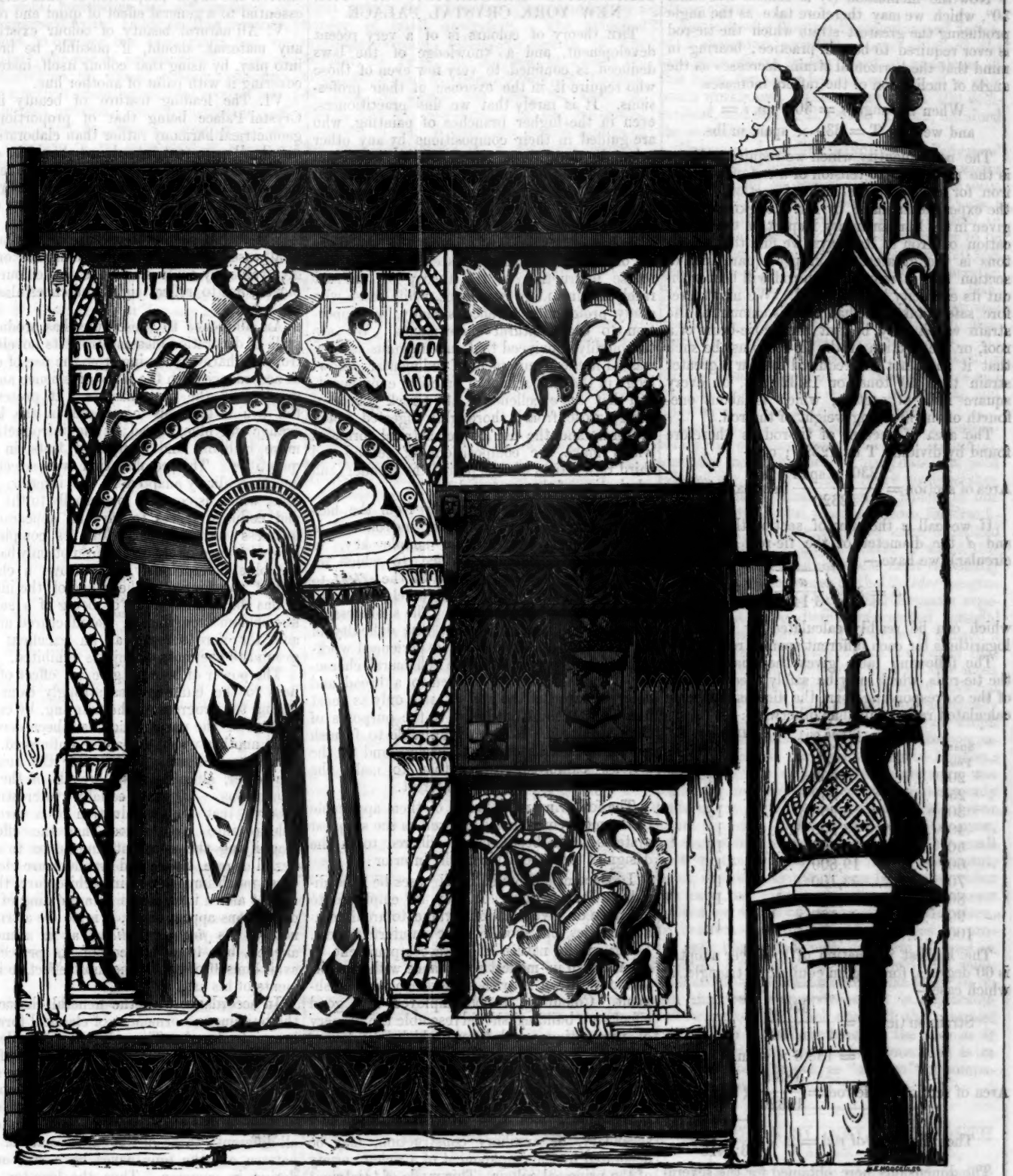
To correct these evils the Dublin Industrial Improvement Society has been proposed, and we are glad to hear that its organisation is making satisfactory progress. Mr. Cheyne Brady is acting as honorary secretary, and Sir Thos. Deane, Son, and Woodward are the honorary architects.

It is proposed to raise a sum of money by subscription, sufficient to enable the committee to build or improve a small number of houses, and subsequently, should the undertaking realise the anticipations of the promoters, the committee will take the necessary steps for the establishment of a company, and either procure a charter of incorporation, or endeavour to induce the Legislature to pass an Act of Parliament granting the necessary legal powers for more extended operations.

It is unnecessary for us to say that we cordially wish them success. They must, above all things, strive to make the undertaking pay, in a commercial point of view, and thus ensure its continuance.

Trinity College Church, Edinburgh.—The city council have virtually resolved, by a small majority, that this edifice is to be re-erected.

Strike at Shields.—Some of the joiners and house carpenters of North Shields are on strike in a dispute with their employers respecting the hours of labour during winter.



PANEL AND LOCK, FROM HOTEL CLUNY, PARIS.

PANEL, &c. FROM HOTEL CLUNY, PARIS.

THE accompanying woodcut represents a panel from an old chest or wardrobe at the Hotel Cluny, Paris, executed at a period when the Renaissance was coming into vogue in the latter half of the fifteenth century. The hinges and lock are of polished steel, with a red cloth ground in the tracery. The size of the panel, exclusive of the centre piece, is 14 inches by 12 inches. The museum abounds with excellent specimens of mediæval art, the greater part of which may be seen in Du Sommerand's "Arts du Moyen Age."

THE DUBLIN WINTER GARDEN.—The Exhibition building was opened last week as a *Jardin d'hiver*. The morning was intensely cold, and the car-men would call it *Dargan's shiver*. Statues and plants adorn the hall.

TO FIND THE DIMENSIONS OF WROUGHT-IRON TIE-RODS.

THE use of wrought-iron tie-rods instead of heavy timber tie-beams is now becoming so common in the framing of roofs, as to render it necessary to find some exact method of ascertaining the diameter required for such rods in roofs of various spans.

In proceeding to this investigation there are two problems which require solution:—

1*st. What is the horizontal thrust produced by the principal rafters upon the tie-beam?*

2*nd. What is the resistance to tension of a wrought-iron rod for every square inch of section?*

The horizontal thrust (T) upon the ends of a tie-beam is found by the elementary principles of mechanics to be

$$T = \frac{w}{2\tan. i},$$

where w is the weight borne by one of the principal rafters, and i is the angle of inclination of the roof. The weight (w) depends upon the length of the rafters, the distance apart of the trusses, and the weight laid upon each square foot of the roof.

If we call S the span of the roof in feet, then length of rafter $= \frac{\frac{1}{2}S}{\cos. i}$. The distance between the trusses is usually taken at 10 ft.; and the weight laid upon each square foot of roofing is calculated by Tredgold at 66 lbs. including effect of wind, &c.

Therefore we find $w = 66 \times 10 \times \frac{S}{2\cos. i}$ in lbs.

whence $T = \frac{w}{2\tan. i} = \frac{330}{2\sin. i} \times S.$

Now the inclination (i) is seldom less than 30°, which we may therefore take as the angle producing the greatest strain which the tie-rod is ever required to bear in practice; bearing in mind that the horizontal strain decreases as the angle of inclination of the rafters increases.

When the angle $i = 30°$, sin. $i = \frac{1}{2}$,

and we have T = 330 × span, in lbs.

The next quantity which we require to know is the resistance to tension of a rod of wrought iron for every square inch of section. From the experiments made by Mr. Hodgkinson, and given in the Parliamentary Report on the Application of Iron to Railways, we find that eleven tons is the greatest strain per square inch of section that a wrought-iron rod will bear without its elasticity being injured. We may therefore safely take one-half of this amount as the strain which may be put on the tie-beam of a roof, or the section of the tie-rod must be such that it shall not be required to bear a greater strain than 5½ tons, or 12,320 lbs. on every square inch of section, which is about one-fourth of the breaking weight of the rod.

The area of section of tie-rod is therefore found by dividing T by 12320; or—

$$\text{Area of section} = \frac{330 \times \text{span}}{12320} \text{ in square inches.}$$

If we call a the area of section thus found, and d the diameter of the tie-rod (supposed circular), we have—

$$d = 2\sqrt{\frac{a}{3{\cdot}1416}}$$

which can be readily calculated by the aid of logarithms for each different span of roof.

The following table gives the diameters of the tie-rods, which may be safely used for roofs of the corresponding span, the dimensions being calculated rather full than otherwise:—

Span. Feet.	Strain on Tie-rod. lbs.	Diameter of Tie-rod. In.
20	6,600	⅞
25	8,250	1
30	9,900	1⅛
40	13,200	1¼
50	16,500	1⅜
60	19,800	1½
70	23,100	1⅝
80	26,400	1¾
90	29,700	1⅞
100	33,000	

The highest inclination of roof ever adopted is 60 degrees, forming an equilateral triangle, in which case—

$$\text{Strain on tie-rod} = \frac{330}{2 \text{ sin. } 60°} \times \text{span.}$$

$$= 188{\cdot}6 \times \text{span.}$$

$$\text{Area of section of tie-rod} = \frac{188{\cdot}6}{12320} \times \text{span} = a.$$

$$\text{Then diameter of rod} = 2\sqrt{\frac{a}{3{\cdot}1416}}.$$

The dimensions here obtained for the several cases should never be exceeded, as any additional weight of tie-rod produces an increased strain upon the king or queen rods which have to support it.

E. W. Tarn, M.A.

Patent Vitreous Marble.—We have seen at 4, Russell-place, Fitzroy-square, some specimens of a new patent for marbling on glass, or under glass, which presents two noticeable features. 1st, the perfection with which elaborate designs representing mosaics and other ornaments can be produced. And 2nd, the consolidation of the glass surface which deprives this eminently beautiful material of its natural fragility, and renders it extremely useful to the architect for external and internal decoration—glass, like all vitrified substances, being almost indestructible by atmospheric agencies. For floors, walls, mantelpieces, and panels for furniture, the new patent marble is well adapted, and we shall hope, for more reasons than one, to find it extensively adopted. The additional reason is this, that the patent is being worked at the "Ladies' Guild"—an institution opened some time since to aid respectable females who are dependent on their own support. This fact, however, must not be allowed to raise a notion of flimsiness in connection with the work. This would be unjust: it seems sound and good.

CHROMATIC DECORATION OF THE NEW YORK CRYSTAL PALACE.

The theory of colours is of a very recent development, and a knowledge of the laws deduced is confined to very few even of those who require it in the exercise of their professions. It is rarely that we find practitioners, even in the higher branches of painting, who are guided in their compositions by any other principle than those suggested by individual taste and a cultivated eye. It is a question worthy of consideration, how far the mediocrity of painting of the present day is attributable to an overweening reliance on natural powers, and a neglect of the lights of science. In the sister art of music we continually see that those who refuse instruction in the theory of the art rarely attain to any excellence, while those who study profoundly, advance steadily, in proportion to their natural endowments. We are thoroughly convinced that much genius is now wasted in the acquirement of rudimentary knowledge in the slow school of practical experiment, and that the excellence of the Greek school of design arose from a thoroughly digested canon of form, and the use of geometrical formulas which make the compositions of second and third rate artists of that period the wonder and admiration of the present day.

A decoration arising chiefly from the harmony and variety of colours introduced is the style attempted, in a simple key, in the New York Crystal Palace, to which we refer by no means as evidence of the *extent* to which it may be carried, but merely as a commencement in that *direction*. The shortness of time allowed for decoration, the difficulty of obtaining a large number of experienced workmen at short notice, and the ephemeral character of the building, all pointed to a broad and bold treatment of the subject, not only as most feasible, but most conducive to the purposes of the Exhibition. It seemed desirable to furnish a modest and appropriate background to the articles exhibited, rather than to make the building the chief object of interest.

The following rules, many of them applicable to the most complicated, as well as the simplest systems, have been mainly adhered to in the design of the decoration of the interior:—

I. Decoration should in all cases be subordinate to construction. It may be employed to heighten or give additional value to architectural beauties, but should never counterfeit them. Being in the nature of an accompaniment, it should keep in modest accordance with the air, and not drown it with impertinent embellishment. Colouring, to be employed with good effect on a building, should resemble the drapery of the antique sculptures, which, displaying between its folds the forms beneath, serves rather to enhance than to conceal their beauty.

II. All features of main construction should have one prevailing tint, enriched occasionally by the harmonious contrasts of that colour. All secondary, or auxiliary construction, may be decorated by the employment of a richer variety of the principal colour. This mode of treatment is suggested by the distinction which nature has made between the colouring of the trunk, branches, twigs, and leaves of trees.

III. The prevailing colour of the ceilings should be sky-blue, thus borrowing from nature the covering which she has placed over our heads. Monotony may be prevented by the introduction of orange (the natural complement of blue), garnet, and vermilion, in such quantities only as may be necessary to recall these colours employed elsewhere.

IV. Rich and brilliant tints should occur in small quantities, and be employed to attract the eye to the articulations and noble portions of the members, rather than to the members themselves. As in the human figure, variety of colour and form is most displayed in the extremities and joints, to which the broader style of the limbs and trunk serve as a foil, so in buildings, the bases and capitals of columns, brackets of arches, and the framework of panels, would seem legitimate objects for the reception of rich colouring. Occurring at fixed numerical distances, they are measured out in equal proportions as to space, and afford also a due quantity of brilliant and stimulating tints—sufficient to enliven the larger proportion of mild colour so essential to a general effect of quiet and repose.

V. All natural beauty of colour existing in any material, should, if possible, be brought into play, by using that colour itself, instead of covering it with paint of another hue.

VI. The leading feature of beauty in the Crystal Palace being that of proportion and geometrical harmony rather than elaboration of detail, all ornament introduced should be of the same character, mere geometrical outlines and forms to the exclusion of classical decoration, the characteristic of which is an imitation of the organization of foliage.

VII. White should be used in large quantities in all cases of simple compositions, not only to give value, by contrast, to the few colours employed, but to reflect light and cheerfulness to the work.

An adherence to these rules has produced a style of decoration pleasing from its novelty and from the harmony arising from the use of colour in accordance with the laws of science and the practice of the best masters. It presents to the eye a harmony composed in the key of orange and blue, varied by the introduction of more brilliant and compound tints in small quantities. This combination was selected as being peculiarly adapted to the interior. Sky-blue, which is confined principally to the dome and ceilings, serves to give an appearance of loftiness and airiness; while its complement, diluted orange or cream colour, not only balances the blue harmoniously, but throws a cheerful tint of sunshine over the whole of the interior. It has the further merit of being of a subdued hue seldom occurring in manufactured articles, and therefore serving as an excellent background to the mass of objects exhibited.

The power of blue to give an effect of loftiness to the building was strongly exemplified during the progress of the painting, by comparing one of the naves which had been decorated with another which remained unfinished. The former seemed more than double the height of the latter, although they are all of the same dimensions. It was equally interesting to observe that the introduction of a variety of colours into large spaces has the effect of magnifying the apparent dimensions to a wonderful degree. Space and grandeur are elements of so much importance in architecture, that we cannot afford their loss. If a building of great dimensions appear small, it is to be attributed, not to its *fine proportions*, as is sometimes alleged, but to a neglect of its projector to avail himself of one of the most effective instruments of his art.

In accordance with the general character of the building, no ornament of classical forms has been introduced. The only attempt to decorate by means of design has been in the use of mere geometrical lines and figures of a very simple character, which have been executed by common workmen, assisted only by the use of stencil patterns. The ceilings of the four lean-tos are all different: those of the galleries are of a fifth pattern, and the four naves have still another design in common. Thus the lean-tos, which can only be viewed separately on account of their remoteness, offer a variety among themselves; but to the spectator looking upward, a perfect uniformity in the galleries and naves is presented, above which rises the dome, still varied in design, but harmonizing with the rest. This portion of the decorations, which is of the florid Moorish character, rich in colour, and flashing with a profusion of gold and silver ornaments, when viewed by the favourable light of gas, forms a crowning grace and beauty to the Palace, imparting a fairy-like and magical effect to the whole.

The treatment of the exterior requires very few words of comment. It is painted of a uniform bronze tint or olive, enriched by gilding all ornamental features, such as the quatre-foils, the pinnacles, and railings. Where large surfaces occur, a rich orange tint, in imitation of gold, has been substituted for gold-leaf, as more economical. We have heard it objected to the decoration of the exterior; first, that by it the real material of construction is concealed; secondly, that the imitation of a more costly material constitutes a *deception*. In answer to this, we claim the benefit of a distinction

between *counterfeiting* the appearance of a material and borrowing an arrangement of colour suggested by it. In the present instance, no attempt to deceive has been made, but, on the contrary, the use of bronze powder and all other expedients by which painters endeavour to make a perfect imitation of *real* bronze, have been expressly avoided. Since constructions of iron require paint to preserve them from rust, we can conceive of no consideration affecting the choice of colour, other than the character of the building itself and its relation to surrounding objects.*

NOTES AND INQUIRIES.

ARTISTICAL AND ARCHITECTURAL.

Size of Joists.—Will you allow me to ask what the usual method is for calculating the strength of joists required for any given space, and if a floor with a bearing of 15 feet is properly supported by joists 6×2?—P. P.

*** Tredgold gives the following rule:—"Divide the square of the length in feet by the breadth in inches, and the cube root of the quotient multiplied by 2·2 for fir or 2·3 for oak will give the depth in inches." According to this the joists for the bearing named should be 10 inches by 2¼ inches, or 9⅓ inches by 2¾ inches, 12 inches apart.

Metals.—In the early part of 1838 various experiments were made upon specimens of copper prepared by a Mr. Wall with a view to the prevention of the *oxidation* of metals. The surface was said to resist all action by acids, and it was supposed that it would resist any chemical action of salt water. Specimens were tested with very strong muriatic acid and nitrous acid, neither of which produced any apparent change on either specimens. Has this discovery continued to deserve its encomiums, and where can further information be obtained? P.

PROVINCIAL NEWS.

Cuddesdon (*Oxon*).—The Diocesan Training College for Holy Orders, near the Episcopal Palace, founded by the Bishop of Oxford in April last, is now almost completed. It is an extensive structure of Middle-pointed character, affording accommodation for twenty-one students, with vice-principal's rooms, a common room, dining-hall, and oratory.

Lichfield.—A new tower and steeple, in memory of a late vicar, is in course of erection at St. Mary's Church, under the direction of Mr. Street. Mr. Thomas Cooper is the contractor.

Shrewsbury.—The foundation-stone of an intended new Roman Catholic Cathedral, to be erected from the designs of Mr. E. W. Pugin, was laid on Monday in last week. This new building, which will cost upwards of 10,000*l.* will be the gift of the young Earl of Shrewsbury, who attained his majority on Sunday before last. The site is at Belmont, about 200 yards from the old chapel. The exterior will be of fine white sand-stone, and in the interior Bath and Caen stone will be used. The plan consists of three sacristies; a chancel, 41 feet by 23; lateral chapel, 13 by 11; nave, 81 by 23; aisles 81 by 11; tower and spire (at south-west corner), 227 feet high, the base measuring, from buttress to buttress, 40 feet; entire length of interior, 124 feet, and breadth, 51 feet. The church will hold 1,000 persons, and the style is Early Decorated.

Worcester.—The surveyor of the Local Board of Health here has resigned his office.

Merthyr.—The new workhouse here has been completed, to the satisfaction of the architects. Messrs. Aickin and Capes, and the guardians. Mr. Thomas, the contractor, according to the *Cambrian*, has been a loser by the contract in consequence of the great rise in materials and wages since he undertook the job.

Ashton-under-Lyne.—The east window of St. Peter's Church, has been decorated with stained glass. The window is a Catherine wheel, 14 feet in diameter, and divided into sixteen cinquefoiled compartments, the tracery of which terminates on an inner circle, or star of eight points, the whole being surrounded by a border of small quatrefoils. The principal openings contain, full-length figures of The Saviour, St. Peter, St. Andrew, St. James the Great, St. Philip, St. Bartholomew, St. Thomas, St. Paul, St. James the Less, St. Jude, St. Simon, and St. Matthias. In the horizontal divisions of the tracery are placed figures of the four Evangelists in a reclining posture, as in the act of writing their gospel. The background is diapered. Within the divisions of the inner circle are displayed, on a radiant ground, the Hebrew word Jehovah, the Dove, the Lamb, the celestial Crown, the Book with seven Seals, the monogram I.H.S. the Alpha and Omega, and the Sacramental Cup. In a lower compartment is inscribed, "The Gift of George Heginbottom, Esq. 1853." The window was executed by Mr. David Evans, of Shrewsbury, from a design by his son, Mr. Charles Evans.

Eccleston.—The *Chester Chronicle* states that the refitting and other alterations in Eccleston Church have been completed at the expense and under the superintendence of the Marquis of Westminster, and from plans, &c. furnished by Mr. Hodkinson, architect, and carried out by Messrs. Williams and Bellis, all of Chester.

Manchester.—The first column stone of a covered market, to be erected on the site of the present Smithfield market, was laid on Thursday in last week. An oblong square was obtained by clearing, 440 feet long by 244 feet wide, bounded by a line of new shops looking into the market. The whole of this place is to be covered with a ridge-and-furrow roof, in four divisions, like a railway-station roof. One side will be formed by the shops: the opposite side formed by Oswald-street, will be an open arcade, of pillars, 25 feet high, and sixteen arches, each of 18 feet span. The average height to apex of centre bays will be about 43 feet. Of strong rough plate glass there will be upwards of 60,000 square feet used. Between the louvreing and gutter the roof will be covered with slate. The present lamp and fountain will be removed; the site they now occupy is not in the centre of the new area, and there will not be a centre bay, so that they must either be dispensed with, or there must be one on each of the centre bays. A large number of competing designs, says the local *Courier*, by parties of well-known skill, were sent in, including designs from London, Dublin, Birmingham, Glasgow, and Derby. The plans, when obtained, were submitted to Mr. W. Fairbairn, who awarded the premium to Mr. Wheeldon, of Derby, manager for Mr. Haywood, of the Phœnix and Derwent foundries. The work will be done under the superintendence of Mr. Fairbairn, and on his recommendation Mr. Henry Bake has been appointed clerk of the works. The contract for the covering is 15,000*l.* but the total cost will be upwards of 30,000*l.*: this includes the purchase of the property between Scholes-street and Foundry-lane, also the erection of the tier of shops, the draining and flagging of the surface, and obtaining a good supply of water for the market.

Preston.—According to the local *Guardian*, the (R.C.) church of St. Walburge, designed by Mr. Hansom, architect, on the Maudlands, is now making great progress towards completion. The building has been reared, roofed, and slated, and on the east and west gables, crosses, bearing the image of our Saviour crucified, have been placed. The rood on the west gable has on one side of it the figure of the Virgin, and on the other that of St. John. At the east end, over the great window, a four-light window has been inserted, and also a window containing five lights over the Catherine-wheel window at the west end. Exteriorly, the building measures 170 feet long, by 60 feet wide; about 35 feet to the square, and 82 feet to the roofing. The roof is composed of thirteen principals, containing more than 7,000 pieces of timber, and is covered with boards laid on in a diagonal manner, and amounting to upwards of 18,000 feet square: the whole will be stained and varnished. The weight of timber is about 100 tons, and the weight of lead and slate about 100 tons also. The woodwork has been executed by Mr. John Walker, of Preston, builder. The contract for slating has been performed by Mr. George Pye, of same town.

Sunderland.—Messrs. Pennington and Jervis, of Manchester, architects, have obtained the first prize offered by the board of guardians of this town, for plans for the erection of a new union workhouse. There were about 100 competitors, and Mr. J. E. Oates, of York, obtained the second prize.

Glasgow.—According to the *Glasgow Reformers' Gazette*, the foundations of other three iron works have been laid on the south side of the city. The largest is an extension of Mr. M'Vicar's Glasgow Chain and Iron Works. The roof of the house in which the forge hammers are to be placed forms a semicircle, 100 feet long, 70 feet span, and 35 feet high. A large engineering work, in course of erection for Messrs. Randolph and Elder, will occupy the vacant ground bounded by Dale-street, West-street, and Melville-street, about 4,600 square yards. At Govan-croft, large premises have been taken by Messrs. James Grandison and Son, founders and machine makers, five stories in height, and covering 5,000 square yards of ground.

Hamilton.—The "water-rate," says a contemporary, is creating inflammation at Hamilton, while the much heavier "whisky-rate" is paid quite coolly. It is a very strange circumstance that the most nominally religious moiety of our native country is the most notorious for drunkenness, and that precisely the most sanctified districts of that moiety are those in which this disgusting and degrading vice is most rampantly prevalent. Let no reader of the *Builder* imagine that this may merely be an Englishman's repetition of a groundless exaggerated scandal against his neighbours. The writer is himself a Scotsman, and with pain he acknowledges that the charge is but too true. One of the most striking contrasts which he first noted between London and Edinburgh, but far more especially between London and Glasgow, in all of which places he has resided for years, was the comparative sobriety of the lower orders in London: if the ruling vice of his poorer countrymen was disgusting in his eyes before, this contrast only rendered it still more hideous. The lower orders of Irish, however, with which Glasgow, and even Edinburgh, is infested, merit no small share in the obloquy. The most intelligent, clever, drunken, and worthless fellow the writer ever knew, however, among the working classes at Glasgow, was a tailor, a native of Hamilton. He believes that inadequacy of wages to provide such homes and such comforts as tend in England to preserve the self-respect and independence of the working classes has much to do with this vice; but above all it is deplorable that the hell-broth which does all the mischief is not placed beyond the reach of the poor *as it is in England*. As for gin, injurious as it is in other respects, it is but as "swipes" in comparison to whisky.

PROSPECTS IN SYDNEY, NEW SOUTH WALES.

I HAVE lately had the pleasure of reading your valuable paper, and in doing so it occurred to me that the *Builder* was the proper medium through which to inform the mechanics of England of the opportunity now open to them of improving their condition.

The *Talavera* emigrant ship arrived here last week, and the whole of her passengers were engaged at the highest rate of wages on the same morning allowed by Government for employers to visit the ship.

Every description of labour is extravagantly high in Sydney at present, and is likely to continue so. The first proposition is fully borne out when masons are receiving 16s.; bricklayers, 14s.; plasterers, 13s.; carpenters and joiners, 12s. to 13s.; sawyers, 14s.; quarrymen, 20s.; labourers, 10s. to 11s. per day; and all other trades in proportion. The latter is amply proved when I mention that St. Andrew's Cathedral (Episcopalian), St. Mary's Cathedral (Roman Catholic), St. Philip's (new church), St. Paul's, Trinity, and Christ Church all remain in an unfinished state for want of labour—not particularising the numerous stores, shops, and residences, waiting completion. In addition to all this, there are the new Exchange,

* The foregoing is from *The Illustrated Record of the New York Exhibition*, published by Messrs. Putnam and Co. New York, and Messrs. Low, of Ludgate-hill, London. This has now reached twelve numbers, and is a very creditable publication.

new Post-office, Colonial Treasury, and Mint, Circular Wharf, and other works of equal magnitude, which the Government and public companies would immediately commence if the labour market was somewhat easier. These works alone would afford profitable employment for thousands of the industrious tradesmen of England of the present and rising generation.

The list of prices now given are those paid this week. What they may be next I cannot pretend to say—perhaps the minimum advance in these times is 1s. per day.

Nothing but a strong feeling of what I consider my duty to advance the interests of the colony and benefit the working classes at home has urged me to trouble you with this communication. I have no object to serve, no interest to promote of a personal nature, and the greatest reduction in the price of labour would not in the smallest degree affect my circumstances or position. I pledge my honour for the accuracy of these statements, and refer you to the most respectable firms in London (names annexed) as to my credibility.

In order that my remarks may not be calculated to mislead, and that intending emigrants may form some idea of the expenses of living in this "land of plenty," I will conclude with a price list of the chief requisites in family use:—Bread, 4 lb. loaf, 6½d. to 7d.; butter, 2s. 6d to 2s. 9d. per lb.; cheese, 10d. to 1s.; beef and mutton, 4d. to 4½d.; sugar, 3½d. to 4d.; tea, 1s. to 1s. 3d.; coffee, 14d.; candles, 6d. to 7d. per pound; proportionately for other articles; and these prices are higher than they have been for the past five or six years. A. H.

Sydney, Sept. 12th.

DISEASE AND CONTAMINATED WATER.

The following, I apprehend, is in support of the views advanced in the important article on the "vehicles" (if not origin) of choleraic contagion in your last number.

A near connexion of mine, in Wiltshire, not long since built two batches of cottages—one on the upper part of a hill, the other half-way down—both connected by the same line of sewage. The upper batch remained quite healthy, whilst the lower became suddenly the prey of typhus of a malignant type. Both sets of cottages were on the slope of the Great Northern escarpment of the Chalk Downs—the country open, and remarkably healthy; so that my brother-in-law felt much puzzled to account for the mischief: he persevered, however, in his study of the subject, and it occurred to him at last, that although not built many years, it was possible that the sewage might be more or less choaked. On investigation, he found that the water of the well of the lower cottages became at times turbid, evidently by matters that found their way through the brick lining of the said well, which was placed *too near* the drain: this last was immediately opened, and the proprietor's suspicion verified. When the drain was put to rights the disease soon disappeared.

Now this tale appears to be a sort of normal history, which has, I much fear, not much in the way of novelty—at least, with reference to frequency of occurrence. How far the truth it embodies (of the relation between disease and contaminated water) has been acted on, I know not; but this opportunity is taken of again urging the necessity of noticing in sanitary reports the relative position of the wells and sewers. R. J. Nelson, Capt. R.E.

The Iron Trade.—We are glad to hear, from the *Birmingham Journal*, that "the losses sustained this year by speculators have been so heavy that there is no probability of prices being forced up again, undoubtedly to the great inconvenience and loss of the legitimate trader, whose channels, both of supply of materials and also of sale of produce, are so largely interfered with by these operations, and whose most careful calculations, even when made upon comprehensive surveys of probable future consumption and demand, are liable to be rendered altogether nugatory thereby." Prices now quoted in the *Times* are—for bars of best brands, 10*l.* and 9*l.* 10s. for secondary articles; hot blast mine pigs, 4*l.* 15s.; cold blast, 5*l.* 5s. to 5*l.* 10s.; and hot blast cinder pigs, 4*l.* to 4*l.* 5s.

AMERICAN NEWS.

Monuments.—The Washington Monument is now 150 feet high, and, when completed, will be about 500. It is found that the monument stands exactly in the middle of what was the "ten miles square." Mr. Powers has received an order at Florence, from Boston, for a bronze statue of the late Daniel Webster, to be placed in front of the Massachusetts State House.

Building at Boston.—An extensive building is now being erected on the corner of Atkinson and Purchase streets, which will extend to Pearl-street, and connect with a large store there, so that the entire depth of the building will be 215 feet. This addition will be five stories in height, having a front of 113 feet, and depth of 117 feet. The front will be of granite. The estimated cost of it is 100,000 dollars. The style is comparatively plain. The contractors are J. E. and N. Brown and Co. The building is for mercantile purposes. The number of "splendid stores" erected in the business portion of the city for the present year has been greater than for several years preceding.

Elastic Railway Tracks.—The elasticity and smoothness of motion, still a *desideratum* on railways, to enable passengers to read freely as well as converse quietly, are proposed to be attained by a device called "Babcock's Railroad Track-supporter and Track-spring," in which elasticity is applied to the rails instead of to the carriages. This elasticity Mr. Babcock provides by means of air-tight metal boxes, each inclosing a circular piece of India-rubber, a box being set into each end of every tie, just under the rail. The rail merely settles a little on each India-rubber spring as the train presses upon it, and rising again when it has passed, leaves the track as before. The entire cost of this apparatus is estimated by the inventor at some 1,200 to 1,500 dollars a mile; and he calculates the average yearly saving thereby in wear of track and rails alone at 350 dollars a mile.

Impromptu Gas-lighting.—The Art-Union building, New York, was brilliantly illuminated one evening lately by gas generated upon the spot, and instantly applied. In a large room, a gasometer, containing about 40 cubic feet, was filled with common air. By a gentle pressure the air is forced through a new hydro-carbon fluid, and after being so passed, it yields, it is said, a brilliant light, in the manner of the best coal-gas. The fluid is called *Kerosene* by the discoverer. It is obtained abundantly from an asphaltic rock in the province of New Brunswick.

CITY THOROUGHFARES.

A very great advantage to the public might be given by a more direct communication between the west and east sides of London, in avoiding the thronged parts, such as the Strand, Fleet-street, Ludgate-hill, Cheapside, &c.

I see by the map before me that commencing (say at Hyde-park-corner as the west-end starting-point) a clear line of communication to Shoreditch Church in the east, giving thereby better access to the Hackney and Newington roads, leading to the counties of Essex, Herts, &c. (as well as the Eastern Counties Railway terminus, Victoria-park, &c.), may be formed by proceeding along Piccadilly, Coventry-street, Long-acre, and Great Queen-street, continuing through into Holborn from the junction of Great and Little Queen-streets in a slanting direction through Little Turnstile into the wide part of Holborn opposite Day and Martin's warehouse, thence along Holborn to Middle-row, leaving it on the right hand, and taking down two or more houses at the east and west corners of Gray's-inn-lane, and proceeding in a slanting direction across Brook's-market, by the end of Greville-street, across Leather-lane, Hatton-garden, Saffron-hill, Victoria-street (with a viaduct or bridge, thereby doing away with any hills of consequence through the whole line), straight on to the end of Wilderness-row, widening the same, and so into Old-street-road, thus completing the route already specified.

The great advantage to be gained is, that all the traffic through the circuitous route by St. Paul's, &c. will be entirely avoided, not only by those persons coming from Knightsbridge, &c. but also that all those coming from Notting-hill, &c. will receive the same benefit on arriving at Middle-row, avoiding the dangers of Holborn-hill and Skinner-street, and having a shorter distance to travel. By this arrangement the roadway at Middle-row, would be very much widened, and so do away with any necessity for taking it down: another advantage would be a more direct mode of omnibus and other conveyances for the public generally to all parts of the east as well as Islington in the north, and doing away with the frequent stoppages that take place at Gray's-inn-lane end, besides shortening the distance by at least one mile between the two before-mentioned points, viz. Hyde-park-corner and Shoreditch Church. W. R.

APHORISMS OF ART.

Perhaps no writer has yet given to the world a work which is in itself an epitome of all that is best worth knowing in art. Such a work would be invaluable. There are innumerable books, lectures, and dissertations on the fine arts; and discussions, where nothing is decided about the terms and abstruse sentiments which occur in the consideration of them. Even these are interesting and full of suggestions to the thoughtful reader, who has abundance of leisure. But the majority of persons in search of information of these subjects cannot afford the time to read many books containing matter that is foreign and adventitious: they want to get at and retain such principles as are received as true by general consent, founded on just and accurate observation, of universal application, and indispensable to excellence in their profession. To give practical value to these truths, it is required that they be expressed in a few words. We want a man of industry to collect the golden rules of art that lie scattered through so many volumes,—all such as have been inculcated by great artists in their short but pregnant sayings. Great treasure lies in these maxims. Men of extensive practice will be liable to err: what they conceive their best concerted plans fail, from ignorance or neglect of them. A knowledge of these aphorisms improves the powers requisite for the productions of genius. We are enabled by them to feel the force of imagination, the refinement, the power of representing and idealizing, the sensibility, the invention and judgment displayed in the arts. Then, whatever department we choose, whatever examples we select for imitation; whether skill in theory or practice be our ambition, recourse should be had to aphorisms. They are helps both to the young and the old: they confirm those who are judges of truth, and assist inquirers for it. Like the ancient writings, bound on the forehead, and containing something worth remembering, they should be impressed on the memory, and borne constantly in mind.

F. Lush.

DRAINAGE AND WATER IN THE COUNTRY.

The Ely Board of Health opened the several tenders for water-tank and castings on 16th inst., and the tender of Messrs. Headley and Manning, of Cambridge, being the lowest, was accepted at the sum of 1190*l.* 13s. 5d. for both tank and castings.——At Cheltenham, the first special rate towards the liquidation of the debt of 11,000*l.* the estimated cost of the new main sewers, is about to be allowed by the Commissioners. It amounts to five farthings in the pound on the assessable value of the property included in the district, and it is understood that a rate of one penny will be sufficient in future years. "No one," says the local *Journal*, "will grudge such an impost for so good and essential a purpose, and the fact that the amount is not larger is the best answer to those who predicted the ruin of the borough from the operation of the Improvement Act."——The St. Helens Water Works are now approaching completion. They are situated on Eccleston-hill, about 240 feet above the level of the town, and will cost 12,000*l.* The water springs from the red sandstone, and has been found on analysis to be remarkably pure. It is pumped by an engine of 47-horse power, with a 36-inch cylinder, built on the Cornish principle, by Mr. Robert Daglish, of St. Helens. The probable quantity per day is 1,000,000 gallons. The reservoir, which is an extensive cave, will hold about 1,400,000 gallons; and the mains from the works are 12 inches in diameter. The water from the old reservoir and the old mains will be reserved for manufactories.——The Wakefield

Council have adopted a resolution, empowering Mr. Ranger to report on a better supply of water for the borough, to value the present Waterworks' Company's plant, estimate the present quantity of water, and report on its quality. The clerk of works has also been directed to prepare plans of a general system of sewerage for the whole borough.——An efficient system of sewerage is about to be carried into effect at Carlisle early in the ensuing spring. The report of Mr. Rawlinson, detailing the plan by which he proposes to sewer the town, was laid before the Town Council on Tuesday in last week, and unanimously adopted. The concluding paragraph states, that "There are about 18,625 lineal yards of public sewers and drains, or about 10 miles, 1025 yards, exclusive of house branches and other private drains provided for in the estimate. There will also be provided upwards of 4,000 side junctions, 150 man-holes, and 300 street gullies, all fixed complete, for say 23,000*l*."

HOUSES FOR FREEHOLD LAND SOCIETIES.

The article on Freehold Land Societies, in your number of November 19th, has, I have no doubt, given many of your readers sincere pleasure. That such societies should be viewed favourably by the *Builder* is only natural, but I venture to suggest whether you might not render a substantial service to those persons who are intending the erection of cottage or small villa residences upon the land, of which, through the medium of these associations, they have become the possessors.

Your Bradford correspondent, referring to the labouring man, says in the quotation which you give, "Why should he not, while he makes the arrangement *within* his dwelling conducive to the health, convenience, and comfort of its inmates, endeavour to add to the neatness and comeliness of its appearance without?" The question appears to me easy of solution, not only why *he*, but also why a class superior to him in point of means, neglect to do this: *it is the not knowing how to set about it*—the not having access to plans and estimates for such buildings, and the opinion (I trust an erroneous one) that any thing sightly must be necessarily expensive. I fear the building on these estates has been too much a game of follow the leader, and that the leader has commonly been a man of no taste; one to whom a house is simply a thing to live in, rather than a *home*—a word which seems to involve a certain amount of quiet beauty.

I am not about to advocate every man becoming his own architect, for I am persuaded the cases are very rare in which it is safe to build the humblest tenement without professional assistance; but I do think that the more the classes to which I allude, are made acquainted with the nature of their own wants, and with what they may reasonably expect in return for a certain amount of capital expended, the better it will be for them.

I venture to suggest the following matters, to which your own knowledge and experience will doubtless add others equally important, on which information should be given.

1. *Fencing.*—The comparative merits of various kinds; additional cost of increased height; advantages or not of tarring, &c.

2. *Advice respecting Cottage and Villa Residences.*—Merits of detached and semi-detached, with ground plans and elevations, say ranging from 80*l*. to 500*l*. (200*l*. and 300*l*. houses are frequently required).

3. *Foundations* as modified by local circumstances of soil, &c.; *cellars, drains, water-closets, cess-pools, wells, water laid on;* additional cost for conveying water to the upper rooms; best method of *collecting rain water*; cost of laying *gas-pipes:* under this head might be treated all matters relating to health, especially as promoted by dryness and cleanliness.

4. Paths and surface soil near the house—whether advisable in a clay soil to burn earth for a substratum as is now often done—with the best method, and probable expense.

The cost of a house, and of all the operations connected with its erection, must of course vary very much from local causes; but I should imagine an estimate might be made, which would approximate (at a certain given price for materials) to something within 10 per cent. of the actual outlay which would be required.

As I doubt not you have the managing directors of these societies among your readers, allow me to ask them if they have done all in their power to promote the erection of suitable dwellings—nay, if most of them have done any thing beyond defining the building lines, and stipulating that the houses shall be detached or semi-detached, and of a certain minimum value. Truly, any one who visits most of the estates, after surveying the unsightly tenements which will meet him at every turn, must mourn with your Bradford correspondent over a good opportunity thrown away; but with the energetic assistance of the *Builder*, we may look hopefully to the future. FREEHOLDER.

ASSESSMENT OF MARKET-GARDEN LAND, FULHAM.

The parish of Fulham has been resurveyed, under order of the Poor-Law Board, which came into operation upon making the last rate for the relief of the poor, dated 16th October, 1853. The appellants were Messrs. Fitch, Mr. Broadbent, Mr. Poupart, Mr. Steele, &c. The number of market-gardeners in Fulham, as stated by the parish surveyor, is sixteen or eighteen. The rating of land in Fulham has been generally raised from 20 per cent. to 30 per cent. and in some instances from 4*l*. or 5*l*. to 6*l*. 15s., 8*l*. and even 10*l*. per acre. On Monday the special session was held for the western division of the county of Middlesex, at the Holland Arms, Kensington, before a full bench. Mr. Sleigh, barrister, Mr. Curwood, solicitor; supported by Mr. Paine, surveyor, Mr. James Poupart, Mr. E. M. Newman, &c. appeared for the appellants. Mr. Jones, solicitor, Mr. Hackman, vestry-clerk, Mr. M. Clure, surveyor, for the respondent parish. Mr. Paine said:—Rental was no correct criterion of assessment. Mr. Broadbent's land was good land in ordinary cultivation, and its outside value was 6*l*. 10s. per annum, *i. e.* "from year to year," &c. subject to statutable deductions as follows, viz. 10*l*. for repairs of homesteads, &c.; 2*l*. for insurance on 800*l*.; to reinstate, 10s. per acre per annum for the maintenance of gates, fences, &c. Hothouses and growing fruit-trees, as stock in trade, were not separately rateable. Hothouses conferred a certain additional value on land, but the cost of maintenance was great. Fruit-trees were generally planted on the best land. Land was equally assessed throughout the parish in comparison with the gas-works. The preceding deductions brought the value of Mr. Broadbent's land to a rateable value of about 5*l*. an acre (78*l*.), which was charged 110*l*. or 8*l*. per acre in the new survey. Mr. Broadbent stated that he paid 98*l*. per annum, on lease. The exhalations from the gas-works were prejudicial to vegetation, and deteriorative of the value of his property. Mr. M. Clure supported the assessment of Mr. Broadbent's land at 8*l*. per acre, which he designated as the "best land in the parish." He had valued the whole land throughout the parish at its full value. Mr. Hackman confirmed Mr. M. Clure's statement. After some discussion among the magistrates, it was decided that the appellant's assessment should be reduced to 90*l*. Mr. Sleigh applied for costs, which were immediately granted, when the respondents gave notice of appeal to quarter sessions. The Sewage Manure Company's works were reduced 40*l*.; Mr. Hughes's brickfields 100*l*. Mr. Fitch's appeal, also Mr. Poupart's and Mr. Steele's, were adjourned to January 9, 1854.

VALUE OF FREEHOLD LAND FOR EXTRA-MURAL INTERMENTS.

From a report of the Burial Board of the parish of St. Mary, Islington, to the vestry, and from the statements of the several speakers at a meeting of the vestry, it appears that the Board had proposals of land for their extramural cemetery situate in the Hornsey-road, Finchley, Bushy-heath, Hanwell, Forbes-green, Hornsey, Totteridge, East Barnet, Pinner, Southall, Bagshot, Walton, near Brentwood, Romford, Bromley, and by the great Extramural Cemetery Association, and the London Necropolis and National Mausoleum Company.

The purchase-money required per acre varied in a most conflicting ratio, viz. 875*l*. 850*l*. 500*l*. 400*l*. 350*l*. 300*l*. 200*l*. and 105*l*.; but all the offers below 300*l*. an acre were considered ineligible either from the distance or the mixed tenure, or being within the prescribed distance.

The recommendation of the Board was to purchase 30 acres of the St. Pancras Burial Board of the latter's freehold estate called the Horse-shoe Farm, at Finchley, lying at a distance of two miles from the north end of Islington parish, at 300*l*. per acre, and attended with the further proviso, that the parish of St. Mary was to bear its proportion of the expenses in redeeming the land-tax upon the estate; and in the event of any future purchase or exchange of land adjoining the cemetery, the expenses to be borne proportionably; the expenses of interments to be assimilated by the two parishes; and that no Pancras man be buried in St. Mary's, or *vice versâ*, except under peculiar consideration. The chapels to be used alternately. That for the first twenty years a rent should be paid to St. Pancras, at the rate of three-eighths of the cost, and interest of the outlay for making and repairing the chapels and two main roads; and that afterwards the chapels and roads be kept up at the cost of both parishes in equal moieties.

Notices of Books.

The Architecture of the Farm. A series of designs for Farm-houses, Farmsteadings, Factor's Houses, and Labourers' Cottages, with descriptions. By John Starforth, Architect. Blackwood and Sons: Edinburgh and London. 1853.

We have had Mr. Starforth's work before us for some time, intending to treat at length the subject of farm and cottage building in continuation of previous observations on the same matters, which have appeared in our pages. More pressing topics have delayed the realization of the desire, and we think it better, therefore, at once, briefly to make known the scope of the work to our readers. It contains on 62 plates, lithographed (as sharply as etchings) plans, elevations, and details of cottages, proprietors' residences, and farmsteadings, with brief descriptions and estimates. The plans are for the most part very well arranged, and the elevations appropriate and good. We have been always anxious to impress on those who build farms, and labourers' cottages (with Sir Uvedale Price), that the difference in expense between good and bad forms, is comparatively trifling—the difference in their appearance immense. Mr. Starforth's volume will help to make this clear. The author says, in his preface, that he has spared "no pains to produce a practical and useful volume;" and it seems to us that he has succeeded in doing so.

We may take the opportunity to mention that the second volume of the new issue of the "Encyclopædia Britannica" (A. and C. Black, Edinburgh) contains two important articles bearing on the subject—agriculture, and agricultural chemistry. The designs which accompany the first, however, are very inferior.

Portable Buildings, designed and built by Charles F. Bielefield. London: Rickerby, Cannon-street. 1853.

This little volume comprises views and plans of the buildings of waterproof papier-maché composition, before noticed in our pages, as patented by the well-known papier-maché manufacturer, Mr. Bielefield, for the colonies, in the form of villas, cottages, chapels, and stores. What next?

Variorum.

Mr. Nieson, the well-known actuary, has published an "Analytical view of Railway Accidents," from which it is so far satisfactory to observe, that accidents from causes under the control of the companies, are rapidly diminishing. We have received a copy of a small pamphlet, for general distribution, at a cheap rate, containing a lecture on "Sanitary Reform," by the Rev. C. Girdlestone, M.A. rector of Kingswinford, delivered at Stourbridge, published for the Local Sanitary Association, and which might be turned to useful account in every direction. Messrs. Longman have issued a little "Stepping-stone to Roman History," by Fanny Parkhurst, somewhat in the style of Pinnock's Catechisms, and useful to put into the hands of the young. A preliminary report to the directors of the Crystal Palace at Sydenham, on the subject of a grand organ for the palace, gives us a notion of what may be done in music on a gigantic scale. The instrument *contemplated*, will be 140 feet high, 50 feet in depth, and stretch across the transept at its eastern end: it will cost 25,000*l*. What is more, it is calculated that it will *pay*, if the Apollonicon be any criterion, which in a few years *paid* to the tune of 40,000*l*. A grand organ would infuse life

into everything in and around the Crystal Palace. It seems to be a question whether the organ should be in the open palace itself, or in a limited and separate building for grand concerts, &c. It is suggested that both purposes may be served by an occasional enclosure of the transept, by gigantic crystal gates! An essay by Mr. G. J. Stevenson, of Lambeth, schoolmaster (Wesley of Paternoster-row, publisher), on the origin of "Alphabetical Characters," attributes these to "a divine origin." So long as we know that the "The Word" is "the true light that lighteneth every man that cometh into the world," perhaps we need not look beyond that divinity within us for the origin of either inborn or out-spoken words, or their alphabetical elements either; but whether Mr. Stevenson will regard us in this as *pro* or *con* in his argument, we know not. In a letter to Lord Palmerston as Home Secretary (no longer such, we regret to say), Mrs. Elizabeth Ruth Banister suggests "A new system of agriculture, drainage, and secondary punishment, for juvenile criminals," in which, amongst other national measures, she recommends the employment of criminals in such work as the production of compost from sewage for agricultural purposes, —a suggestive idea, which accords with our oft-reiterated urgeance of the propriety of causing criminals to work for their own support and the benefit of their country. While treating of railway matters, we have often remarked that the railway system could not be expected to reap its full and adequate fruits until the main trunks and branches of the system spread forth their tendril feeders throughout all parts of the country, not in the shape of costly and cumbrous subsidiary lines, but in some cheap and practicable form. Mr. W. B. Adams, engineer, has written some "Practical Remarks" on these and other subjects connected with railways, recently published by E. Wilson, of the Royal Exchange, which are worthy of attention. "Beauty and the Beast" (Dean and Son, London), is the first result of an endeavour by Miss Corner, aided by the pencil of Alfred Crowquill, to arrange some of the popular stories of our childhood for representation by children. "A Love Story," the truthful and pleasant history of the courtship and marriage of Dr. Dove (from Southey's "Doctor"), and "The Attic Philosopher in Paris," from the French of Emile Souvestre, form the 50th and 51st parts of Longman's "Traveller's Library," and are amongst the most agreeable of the series. M. Souvestre is an honour to French literature, and we cordially recommend his peep at the world from a garret, though it give but, as he says, "the common-place adventures of an unknown thinker in those twelve hostelries of Time—called Months.

Miscellanea.

THE KENSINGTON CONVERSAZIONE.—The first of the Kensington conversazioni for this season was held on the 15th inst. at Great Campden House, kindly placed at the disposal of the committee by Mr. F. Wolley. There was an exceedingly interesting collection of water-colour drawings, including a large number by Mr. John Lewis, and the evening was passed very satisfactorily. A sight of the house itself is worth a day's journey. It is fitted up partly in Mediæval and partly in Renaissance style, with carved oak and tapestry, pictures, and ornamental ceilings. Cabinets and carvings and knicknacks fill every corner of its many twistings, and when the whole is brilliantly lighted, and further enlivened by pretty faces and modern millinery, the effect is very striking.

PROGRESS IN GALVANISM.—The Rev. Nicholas Callan, of Maynooth College, who lately obtained a patent for inventing the means of protecting iron against damp, and published a paper on the large galvanic battery of that college, which he maintains to be the best in Europe, has discovered a new apparatus, it is said, for safely employing the mixed gases to produce the oxyhydrogen flame and lime light; a new voltameter, to which a common jet may be screwed, and the mixed gases inflamed as they issue from it, without the smallest risk of dangerous explosion, and by which the full decomposing effect of a hundred, or any number of cells, arranged in one series, may be produced, without exhausting the power of the battery more rapidly than if it only contained four cells.

THE MODEL LODGING-HOUSE MOVEMENT.—The Bishop of Gloucester and Bristol has made repeated endeavours to excite a public and corporate interest in this movement at Bristol; and recently, in an address issued by his lordship on the subject, he invites approval and co-operation in the immediate realization of a scheme for erecting model lodging-houses in that city, referring all interested to Mr. Ridler, of High-street, bookseller. If sufficiently encouraging, a public meeting is to be called to organise an association.——At Worcester, also, an important and influential meeting has been held, Lord Ward in the chair, for the purpose of forming such an Association. Resolutions of a satisfactory character were unanimously passed, and a committee formed to carry the project into effect. A subscription was also entered into to meet preliminary expenses, and Messrs. Parker and Goldingham were appointed solicitors to the Association, and instructed to take measures to obtain a Royal Charter, an Act of Parliament, or letters patent, to carry out its objects.

PREVENTION OF BOILER EXPLOSIONS.—The editor of the *Nashville Banner*, says the *New York Tribune*, has seen and examined an invention, which he says puts it out of the power of an engineer to explode a boiler, either through negligence or purposely. This improvement provides the upper part of the boiler with two apertures, in addition to the safety-valve, and the bottom with one. These apertures are closed and opened by one cylinder and piston, and by two valves arranged to pass the water from the boiler on to the fire under it, when the steam gets to a given height, thus dampening down the fires and preventing explosion, should the safety-valve and engineers fail to perform their functions.

KIDDERMINSTER PUBLIC ROOMS AND CORN EXCHANGE.—The foundation of the building intended for public rooms and a corn-exchange at Kidderminster having been got in, the first stone was laid on Wednesday, the 7th, with some ceremony, and a dinner afterwards celebrated the event. The site of the building is near the junction of Vicar-street, with the Oxford-road. The architects whose design was selected from a number of competing drawings sent in, are Messrs. Bidlake and Lovatt, of Wolverhampton, the architects of Bilston and Pontypool Town-halls and other public buildings. The edifice will contain a concert-hall, corn-exchange, library, news-room, lecture-room, and school of design. The style adopted is Italian. The building will be erected in red brick with white stone dressings, except the lower story of the front, which will be of white stone, rusticated. The front will be decorated with stone Corinthian pilasters, surmounted by cornice and balustrade, the latter partly of ornamental iron-work backed by stone. The entrance leads to a hall, at the extremity of which will be the entrance of the concert-room, an apartment 85 feet long, 46 feet wide, and 33 feet high, with a panelled ceiling. The Corn-exchange, alongside the music-hall, will be 59 feet long, 36 feet wide, and 20 feet to top of walls, and will have an open iron ornamental roof. It will be lighted by windows on one side and in the roof. The contractor and builder is Mr. John Thompson, of Kidderminster. The cost of the works will be about 6,000*l.*

MANCHESTER CORPORATION GAS-WORKS.—The demand for gas in Manchester has been steadily advancing, and has rendered necessary a yearly extension of the works, and at the beginning of the present year the gas committee decided upon a much larger extension of the works than any previous one, and with it an entire re-arrangement of the whole upon a better system. The new works are now in progress, and are expected to be completed before the commencement of the winter season of 1854. The profits of the gas-making have for years past been devoted to the carrying out of extensive and important improvements in the town. The corporation has obtained powers from Parliament to appropriate for ten years one moiety of the gas profits, which would otherwise be expended on improvements in the city, towards the payment of the annual expenses of obtaining an abundant supply of water for the whole city. It is questionable how far it is proper to make the consumers of gas pay a larger price in order that the profits may be devoted to public improvements, and some think that a rate laid upon all the members of the community would be a more equitable mode of providing funds to carry out improvements for the benefit of all. The present charge for gas by the meter is 5s. per thousand cubic feet, when the annual consumption is under 200,000 cubic feet; for larger quantities there is a scale of discounts, ranging from 2½ per cent. from amounts between 200,000 feet and 400,000 feet, to 20 per cent. for 5,000,000 feet and upwards. The London Gas Companies are charging 4s. per thousand feet, whilst at other places the charge is very considerably lower; for instance, the Whitehaven Gaslight Company charge only 2s. and the Sheffield Company 3s. to all consumers.

ARIEL'S GIRDLE: A TOW-CABLE ACROSS THE ATLANTIC.—We like to see the speculative faculties at work among the multitude, even though the efflorescence be somewhat barren,—not very likely to bear available or practicable fruit,—or even a little wild in its luxuriance. A correspondent, "Revilo," proposes "an entirely new system of navigation upon the great ocean routes," on "the advantages" of which we need not enlarge. "I propose," he says, "that upon some convenient coast point of the United Kingdom, say upon the coast of Donegal, a winding-machine be erected *sufficiently firm* [aye, there's the rub!], and turned by an engine of *five thousand horse power*, a similar one being erected, for example, at New York. The next element of the apparatus would be a cable of the best material, 8,000 miles in length [!] to act as an endless band passing over the two machines. It next being mutually arranged by those directing to despatch their vessels in regular succession, they would be attached to the moving cable at intervals of one mile or less, according to the state of trade, of course, by some simple apparatus capable of detaching the cable if necessary. Being so disposed, the vessels would sustain the cable, while the trifling deflection would allow any vessel sailing across the route to pass." The coolness of this proposal is inimitable.

ADVANTAGE OF EXTENDING QUAYS AND DEEPENING RIVERS.—The growth of Glasgow as a port is instructive. In 1813, when the quay accommodation was 941 feet, the revenue was 5,169*l.* Twenty years later the quay-walls had been extended to between 3,000 and 4,000 feet, and the revenue had increased to about 25,000*l.* In 1843 the length of the quays had been increased to upwards of 7,000 feet, and the revenue to upwards of 40,000*l.* In 1847, with only an addition of 600 feet to the quays, the revenue had reached 59,000*l.* In 1851 the quay-walls had been extended to 10,873 feet, and the revenue reached 68,875*l.* which was increased in 1852 to 76,077*l.* In 1816 the depth of water in the river, at the top of spring-tides, was only 9½ feet, while during the last year the number of vessels which arrived at the harbour, drawing 10 feet water and upwards to 20 feet, was 1,179; of which 189 drew 15 feet and upwards. In 1852 the Clyde Trust revenue was 76,077*l.* The expenditure on new works and improvements in the river and harbour in 1851 was 25,739*l.* and in 1852 it had increased to 52,466*l.* At last meeting of the trustees, 25,000*l.* were voted from the profits of the trust to the fund for removal of tolls and pontages within the municipality. At same meeting the board agreed to apply to Parliament for power to borrow 700,000*l.* wherewith to make further improvements in the harbour. The present surplus revenue of the river will pay the interest of that sum.

BROCK'S MONUMENT, CANADA.—A correspondent, with reference to our account of laying the first stone of the new monument to the late Major-general Brock, on Queenston Heights, has sent us a sketch of the original monument, which he made in 1840, about three months after the attempt to blow up the building by gunpowder. The cracks on the shattered column, from the top to the bottom of the building, varied from 1 inch to 6 inches in width all round: there was a bulge on the south side of the shaft to the extent of about 10 inches, and one on the north side about 6 inches. The monument, which was of cut stone, was erected on the exact spot where Brock fell. Queenston Heights are situated half-way between the town of Niagara and the celebrated Falls, or about 40 miles from Toronto.

PRESTON TOWN-HALL COMPETITION.—Forty-nine competitors have sent designs for the proposed Town-hall, set forth in 450 drawings. The *Preston Guardian* says,—"The committee will doubtless avail themselves of the best and most disinterested advice from skilful judges, and they will select their plan not simply for its beauty, but also for its economy and its fitness for the purposes required. To anticipate their decision is not within our province. We shall content ourselves with merely offering to our readers the impressions produced upon us by a somewhat cursory inspection of the drawings. In the first place, it is curious to observe the great diversity of style chosen by the different exhibitors. There is every possible variety of edifice, from the light and elegant modern Italian, down to the most decided Gothic: even the Elizabethan is not unrepresented. Some of the designers appear to have entirely forgotten the purposes of the plan, and while the results of their labours, if carried into effect, would make an admirable block of shops, or an insurance office, or a market, or a railway station, or a Manchester warehouse, or a church, or almshouses, they are certainly not very suggestive of the thing wanted, namely, a town-hall." The writer mentions designs by Messrs. Banks and Barry, Mr. Mitchell, Mr. Fripp, Mr. Goodchild, Messrs. Clegg and Knowles, Messrs. Lawford and Henneker, and Mr. Latham. The designs are now open to the public.